



GEORGIA DEPARTMENT OF TRANSPORTATION

DRAFT

FOR COMMENT

BRIDGE AND STRUCTURES DETAILING POLICY
MANUAL

OFFICE OF BRIDGE
AND STRUCTURAL DESIGN

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Disclaimer:

This manual is intended to be an aid to designers working on projects for the Georgia Department of Transportation. It is not to be used as a substitute for sound engineering practice and will be used at one's own risk. The Georgia Department of Transportation and the authors of this document are not responsible for the consequences of the use and misuse of the contents of this document.

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1 CAD INFORMATION AND PLAN DETAILING

1.1 PURPOSE

The following CAD information and plan detailing data is provided in order to document the process and procedures that are necessary to produce bridge and retaining wall plans for the Department.

1.2 GENERAL GUIDANCE

An understanding of Bentley Systems Computer Aided Design (CAD) program, MicroStation is assumed, as well as a basic understanding of traditional drafting nomenclature and proper detailing technique.

Background information on MicroStation and basic drafting is beyond the scope of this document.

Guidance regarding design issues can be found in the [GDOT Bridge Design Manual](#).

1.3 REQUIRED PRACTICES

The following are required practices for plan production:

1.3.1 CUSTOMIZATION OF MICROSTATION

All plans shall be detailed using the Office of Bridge and Structural Design's Customization of MicroStation J. The [Bridge MicroStation Customization](#) is available for Consultants on the Web. This customization includes Fonts, User Commands, Cell Libraries, Color Table and Help Documentation.

1.3.2 TEXT

Use the Tool Bar GDOTBridgeTools – BD Text Sizes to detail text. When selected the user command automatically sets the level, weight, style, color, height, width and spacing.

1.3.3 TABLE OF TEXT CODES

<u>Size of Text</u>	<u>Level</u>	<u>Weight</u>	<u>Style</u>	<u>Color</u>	<u>Height</u>	<u>Width</u>	<u>Spacing</u>
	LV	WT	LC	CO			
1/8"	8	2	0(SOL)	3(Red)	.125"	.125"	.063"
3/16"	8	2	0(SOL)	3(Red)	.188"	.188"	.094"

1.3.4 FONTS

All plans shall be detailed using capital letters and the Office of Bridge and Structural Design's fonts. Lower case letters are used to access special characters.

1. There are two fonts – 2 and 49 – which are included the Office of Bridge and Structural Design's Customization of MicroStation.
2. Font 2 is used for detailing
3. Font 49 is a monospaced font used for the General Notes and the Bar Reinforcement Schedule

Listed below is the appearance of Fonts 2 and 49.

1.3.5 FONT 2

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
α β γ δ ε ζ η θ ι κ λ μ ν ξ ο π ρ σ τ υ φ χ ψ ω 1 2 3 4 5 6 7 8 9 0

Since the letters don't line up, use Font 49 graphic below to figure out which letters go with each symbol, since they are the same. The degree symbol is the caret over the number 6 on the keyboard. The open double quote is the accent under the tilde.

1.3.6 FONT 49

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
α β γ δ ε ζ η θ ι κ λ μ ν ξ ο π ρ σ τ υ φ χ ψ ω 1 2 3 4 5 6 7 8 9 0

GDOT BRIDGE DESIGN SEED FILE

The default GDOT Bridge Design MicroStation seed design file is brseed.dgn and is located in C:\GDOT\Bridge\Graphics\seed.

The MU:SU:PU format is set to 1:12:1000. The GRID display is set for feet (crosses) and inches (dots). Coordinate Readout is set for feet-inches-decimals of an inch to four places. The coordinate readout may be changed by going to Settings-Design File-Coordinate Readout and changing Coordinates:Format and Accuracy.

Under no circumstances change the MU:SU:PU format or the GRID display. The results of this would be to distort the design plane and render Cells, User Commands, Drawing Programs and Measurements out of scale and virtually useless.

The center of the design file is coordinate 0, 0 forming a design plane of four quadrants with an area of 357913 square feet.

Quadrant I (+,+) – by default, the GDOT Bridge Design Graphics programs (BRDECK, BRIBNT AND BREBNT) place their output here. These outputs are in full scale and can be manipulated using MicroStation commands.

Quadrant II (-,+) – this area is to be used by the Cad Operators to create details and scale drawings as necessary to complete the plans.

Quadrant III (-,-) – the GDOT Bridge Design Standard Sheets files are located here, when referenced. The original files should never be accessed directly. They should be attached as Reference files to the Active design file and copied into it using the Fence Copy command. This prevents the original Standard files being changed or corrupted. After being copied, these sheets can be moved into their proper places in Quadrant 2.

Quadrant IV (+,-) – this area is reserved for the finished, scaled down (35" x 23") contract sheets. When presented to the GDOT, this should be the only data in the design file. See Final Design File Format document for details.

When a new design (DGN) file is created from the Brseed.dgn file, there is one border cell placed at coordinates 4,-6. Included with all sheet border cells above the top right corner is an X. This X can be edited for a brief sheet description. The X's in the title block, as well as the other data can be edited appropriately, also. The "cell" status must be dropped before the text is edited. Above this sheet border there are three text lines for: County, Project Number, and Site Description. The X's can be edited to provide the required information. These are simple text elements; there is no cell status to be dropped. There is also a "crosshair" drawn for 50 feet in each direction, centered at coordinates 0, 0 for easy visual recognition of the quadrants.

The border cell placed is the Standard English unit cell BORD from the Bridge.cel library. The outer plotting shell on these border cells should measure 35" x 23" when measured on the screen or plotted.

Consultants should use these borders with as little modification as possible to ensure compatibility with GDOT plotting systems, and to maximize detailing area. See detail 3.

1.3.7 CELLS

Georgia DOT has created often used details in a cell library for use in detailing GDOT bridge projects. The BRIDGE.CEL file is included in the GDOT MicroStation customization zip file. As future changes to the cell library are made, the file will be available for download on the GDOT website.

Cells should be modified to fit a particular situation only when absolutely necessary.

1.3.8 MICROSTATION USER COMMANDS

Georgia DOT has created MicroStation User Commands for use in detailing GDOT bridge projects. These files are included in the GDOT MicroStation customization zip file.

1.3.9 BASIC DRAWINGS

All plans shall be detailed using the Office of Bridge and Structural Design's Basic Drawings. Basic Drawings should be modified to fit a particular situation only when absolutely necessary. The [Basic Drawings](#) are available for Consultants on the Web.

Description	File name
AASHTO PSC Beams	
Type I MOD includes End Spans and Intermediate Spans	psc1.dgn
Type II includes End Spans and Intermediate Spans	psc2.dgn
Type III includes End Spans and Intermediate Spans	psc3.dgn
Type IV includes End Spans and Intermediate Spans	psc4.dgn
Type V includes End Spans and Intermediate Spans	psc5.dgn
Bulb Tee PSC Beams	
54 inch Bulb Tee includes End Spans and Intermediate Spans	bulb542.dgn
63 inch Bulb Tee includes End Spans and Intermediate Spans	bulb632.dgn
72 inch Bulb Tee includes End Spans and Intermediate Spans	bulb722.dgn
Miscellaneous	
Beam Table to be used with beam sheets	table.dgn
Neoprene Bearing – 3 sheets Neoprene Bearing without shim plates Neoprene Bearing with shim plates Neoprene Bearing for RCDG	bearing.dgn
Butt Joint Details for Continuous Beams	weld.dgn
Pot Bearing	potbrng.dgn
Handrail Modification Details	handrail.dgn
Kansas Corral Railing	corral.dgn
Georgia Stabilized Embankment (GSE)	
Typical Wall Elevation	gwall1.dgn
Panel Details GSE 3	gwall2.dgn
Partial Panel Details Sheet No 1	gwall3.dgn
Partial Panel Details Sheet No 2	gwall4.dgn
Traffic Barrier and Coping Details	gwall5.dgn
Panel Details GSE 2	gwall6.dgn
Dummy Panel Sheet	gwall7.dgn
Special Design Retaining Wall	
Case I, II, & III	rwall1.dgn
Case I (Level Backfill)	rwall2.dgn
Case II (Sloped Backfill)	rwall3.dgn
Case III (Level Backfill) with Barrier	rwall4.dgn
Miscellaneous Details	rwall5.dgn

Note: sound wall drawings are under revision and will be placed on the web site and in this document at a later date.

1.3.10 GRAPHICS PROGRAMS

All plans shall be detailed using the Office of Bridge and Structural Design's Detailing Programs as a starting point.

1.3.11 PC PROGRAMS

[Deck Section and Concrete Bent](#) are available for download on the Web.

1.3.12 VAX, ALPHA SERVER & PC PROGRAMS AVAILABLE

Several GDOT programs, including General Notes, Runoff, Intermediate Bent, End Bent, Deck Section and Concrete were once supported through use of the Department's Alpha [File] Server. This equipment has been phased out and GDOT programs are now PC-Based.

[PC-Based Bridge Design Software](#)

1.3.13 MICROSTATION DRAWING FILES

All electronic drawings for delivery to the client shall be produced using or imported into Bentley System's MicroStation computer-aided-design and drafting program, Version J/7.

1.3.14 FINAL FORMAT (LAYOUT) OF MICROSTATION FILE(S)

1. Place all drawings in the bottom right quadrant (x coordinates are positive and y coordinates are negative)
2. Coordinates at the top left corner of the outside border should be in increments of 4 feet horizontally and 3 feet vertically
3. No reference files shall be attached
4. All sheets shall be actual sheet size (Architectural Drawing Size D – 24"x36" – dimensions to outside borders are 23" x 35")
5. Place the County Name, Project Number, and Site Description above all the drawings
6. Place the title of each drawing above the drawing
7. Preliminary Layout Drawing(s) – first column
8. Plan Drawings

- a. Start in the second column
- b. Place the drawings in order in roughly a rectangular pattern
- c. First row, Numbered left to right and continue on next row

1.3.15 CONSULTANT'S DELIVERABLE MICROSTATION FILE(S)

After the project is awarded and plans revised to include the amendments or when directed by GDOT, the Consultant shall coordinate with GDOT Bridge Liaison for the delivery of the MicroStation file(s).

1.3.16 EXAMPLE OF THE FINAL FORMAT (LAYOUT) OF MICROSTATION FILE(S)



1.3.17 DISTANCE BETWEEN SECTIONS AND/OR DETAILS

As a general guideline, use approximately 1" between sections and/or details and ½" to the sheet margin. It is understood that the designer may need to reduce these clearances to make effective use of sheets.

However, the designer should always seek to achieve plan clarity over reduction of plan sheets.

1.3.18 DIMENSIONS

1. The following objects shall be dimensioned to the nearest 1/16"
 - a. Beams
 - i. Centerline bent to centerline bearings
 - ii. Beam length
 - iii. Beam deflections
 - b. Bents
 - i. Beam spacing
 - ii. Location of dowel bar, anchor bolts or 1013 bar
 - iii. Pile spacing for end and pile bents
2. The following objects shall be dimensioned to the nearest 1/8"
 - a. All other objects

1.3.19 LINES

Part of the GDOT MicroStation Customization; use the Tool Bar GDOTBridgeTools – BD Lines to detail lines. When selected the user command automatically sets the level, weight, style and color.

1.3.20 TABLE OF LINE CODES

<u>Line Description</u>	<u>Level</u>	<u>Color</u>	<u>Style</u>	<u>Weight</u>
	LV	CO	LC	WT
Solid Concrete Lines	2	0 (White)	0 (SOL)	4
Concrete Construction Joint	2	0 (White)	2 (MEDD)	4
Hidden Concrete Beam Lines	3	6 (Orange)	3 (LNGD)	3
Hidden Concrete Edge Beam Lines	3	6 (Orange)	2 (MEDD)	3
Hidden Concrete Detail Lines	2	0 (White)	5 (SHD)	2
Solid Steel or Rebar Lines	4	1 (Blue)	0 (SOL)	2
Hidden Steel Beam Lines	3	1 (Blue)	3 (LNGD)	3
Hidden Steel Diaphragm Lines	3	1 (Blue)	2 (MEDD)	3
Hidden Steel Detail Lines	4	1 (Blue)	5 (SHD)	2
Centerline	5	2 (Lime)	6 (DADD)	1
Alternate Centerline	5	2 (Lime)	7 (LDSD)	1
Beam Centerline	6	2 (Lime)	4 (DOTD)	1
Dimension Lines	7	3 (Red)	0 (SOL)	1
Approximate New Ground Lines	13	2 (Lime)	0 (SOL)	2
Approximate Original Ground Lines	12	18 (Green)	2 (MEDD)	3
Cross Hatch or Joint Filler Lines	14	4 (Yellow)	0 (SOL)	1
Construction or Grid	12	5 (Lavender)	0 (SOL)	0
Existing Bridge	19	7 (Purple)	0 (SOL)	1
Hidden Existing Bridge	20	7 (Purple)	3 (LNGD)	1

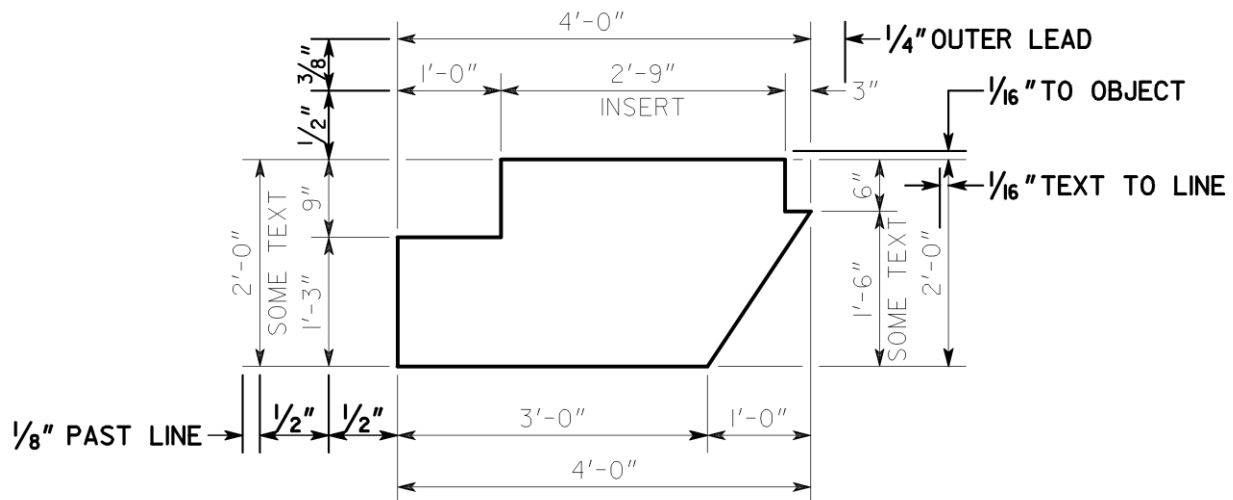
1.3.21 EXAMPLES OF LINES

—————	SOLID CONCRETE LINE
——— · ———	HIDDEN CONCRETE BEAM LINE
——— · ——— · ———	HIDDEN CONCRETE EDGE BEAM LINE
·····	HIDDEN CONCRETE DETAIL LINE
—————	SOLID STEEL LINE
——— · ———	HIDDEN STEEL BEAM LINE
——— · ——— · ———	HIDDEN STEEL DIAPHRAGM LINE
·····	HIDDEN STEEL DETAIL LINE
· · · · ·	℄ BRIDGE OR SURVEY ℄
· · · · ·	ALTERNATE ℄ BRIDGE, SURVEY ℄ OR PGL
· · · · ·	℄ BEAM
—————	DIMENSION LINE
—————	NEW GROUND LINE
——— · ———	ORIGINAL GROUND LINE
—————	CROSS HATCH OR JOINT FILLER LINES
—————	CONSTRUCTION OR GRID LINES
—————	EXISTING BRIDGE LINE
——— · ———	HIDDEN EXISTING BRIDGE LINE

1.3.22 DIMENSION LINES

A Dimension Line has a dimension above or beside the DIMENSION LINE with or without text below the line or after the dimension

1. first dimension line (closest to the structure line) should be $\frac{1}{2}$ " from the detail
2. each additional dimension line shall be placed either $\frac{3}{8}$ " or $\frac{1}{2}$ " base on the text on the previous dimension line
3. a dimension line with dimension beside the line with or without text after the dimension shall be $\frac{1}{4}$ " long



1.3.23 EXTENSION LINE

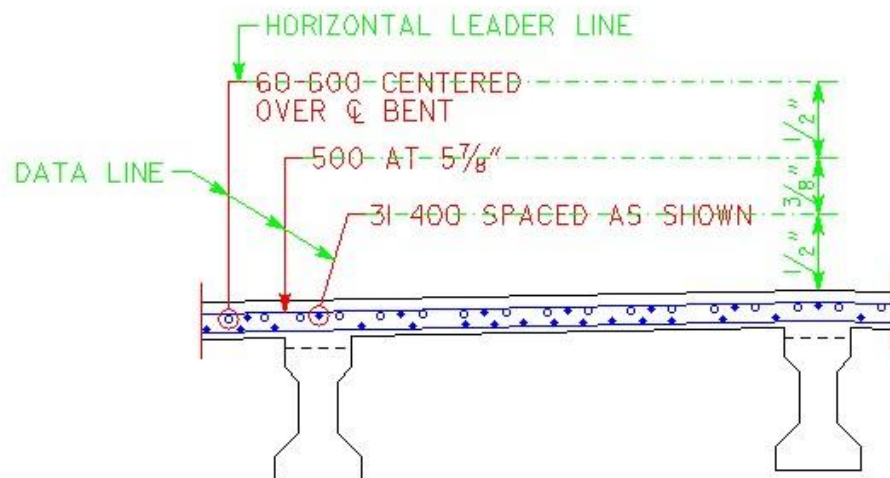
An Extension Line is a DIMENSION LINE between the detail and a dimension line.

1. starts $\frac{1}{16}$ " from the detail
2. continues $\frac{1}{8}$ " past the dimension line
3. crosses another dimension lead line, break the horizontal lead line $\frac{1}{16}$ " on either side of the vertical lead line

1.3.24 LEADER LINE

A Data Line extends between the detail to a LEADER LINE with dimension and/or text beside the LEADER LINE.

1. starts with an arrowhead or circle at the detail
2. ends at a $\frac{1}{8}$ " long horizontal LEADER LINE
 - a. one line of dimension and/or text beside the horizontal LEADER LINE
 - i. the first horizontal LEADER LINE should be a minimum of $\frac{1}{2}$ " from the detail
 - ii. each additional horizontal LEADER LINE should be a minimum of $\frac{3}{8}$ " from the previous horizontal LEADER LINE
 - b. if there is more than one line of dimensions and/or text beside the horizontal LEADER LINE, the minimum of $\frac{1}{2}$ " from the detail and $\frac{3}{8}$ " from the previous horizontal LEADER LINE shall be increased in $\frac{1}{8}$ " increments

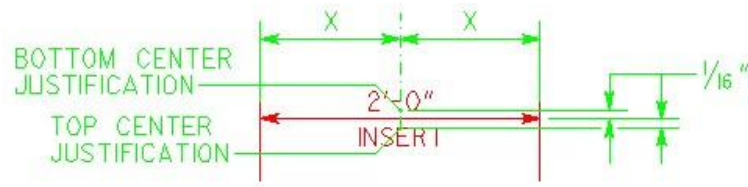


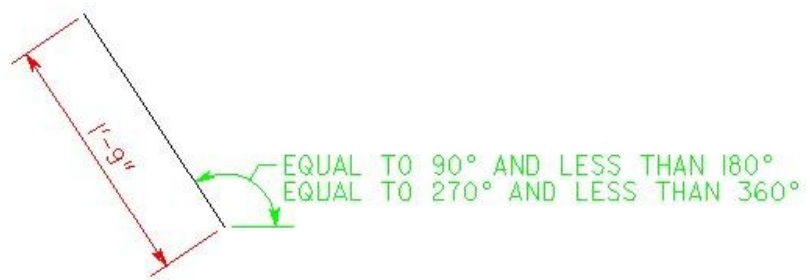
3. Leader line is $\frac{1}{8}$ " long.
4. Leader line with arrowhead is $\frac{1}{4}$ " long.

1.3.25 TEXT PLACEMENT

1. Text should be left center (horizontally left, vertically center), right center, center bottom, center top or center center-justified.
2. Text should be $\frac{1}{16}$ " away (left or right) from lead line, centered above or centered below a dimension line. Text should be $\frac{1}{2}$ of text height above a dimension line or section identification line.

3. Lead Lines should be at the beginning (top left corner) or the end (bottom right corner) of the text. Text should be at center Left or center Right of the text.
4. Titles and lines under titles should have a weight of 3.
5. Dimensions on an angle as shown in the figure below.





1.3.26 PREFORMED FOAM JOINT FILLER

Detail as parallel lines $\frac{1}{8}$ " apart at 45 degrees using Cross Hatched or Joint Filler Lines.

1.3.27 PREFORMED JOINT FILLER

Detail Preformed Joint Filler as parallel lines $\frac{1}{8}$ " apart at 135 degrees using Cross Hatched or Joint Filler Lines.

1.3.28 SILICONE SEALANT

Detail as an opaque shape with the color of Cross Hatched or Joint Filler Lines.


1.3.29 EXISTING END FILL TO BE REMOVED

Detail Existing End Fill to be removed as parallel lines $\frac{1}{4}$ " apart at 45 degrees using Cross Hatched or Joint Filler Lines.

1.3.30 SHADING

Bulb tee beams in the Deck Plan view are often shaded to make the drawing clearer. Here is a way to get the shading to work, designed for the GDOT setup.

1. Set LV=60, WT=0, LC=0, CO=9. Color (CO) can be set to any value 8-15. Color 8 is the lightest, 15 is the darkest, and 16 is solid white to “punch” holes into other shaded areas.

2. Choose **Shape** command from the **Element Creation** toolbar. 

3. In the **Place Shape** dialog box, set **Fill Type** to **Opaque**.

4. Trace over the structure to place the shape on the drawing.

5. Set LV=2

6. Turn off level 60 (OF=60) and select the view using a **data point**.

7. **Fence** the area of the drawing where the shading is to appear.

8. Use the **Add Fence Contents to Working Set** button. 

9. Click the **Drop Working Set** button 

10. Turn level 60 back on (ON=60) and select the view using a **data point**. Update the view.

The shaded area should now appear below all of the other lines instead of on top of them.

To change the shading:

1. click the Change Element to Active Fill Type tool on the Element Manipulation toolbar 

2. Change Fill type to opaque. Identify and accept shape, and it will fill in.

1.3.31 EXTRA SPACES

Place Extra Spaces as follows:

1. Double-spaces after:
 - a. The number one
 - b. An inch mark

2. Add a space between ones (e.g. 1space1).

1.3.32 STATION, STATION AND OFFSET, ANGLE AND BEARING FORMATS

1. Station – STA 34+45.45
2. Station and Offset – STA 34+45.45, 54.45' RT
3. Angle
 - a. 45°-45'-34.4"
 - b. Angles with no degrees – 0°-23'-34.4"
 - c. Angles with 1 to 9 minutes – 45°-08'-34.4"
 - d. Angles with no minutes – 45°-00'-34.4"
 - e. Angles with 1 to 9 seconds – 45°-45'-07"
 - f. Angles with no seconds – 45°-45'-00"
 - g. Angle with no minutes and no seconds – 45°-00'-00"
4. Bearing
 - a. N 45°-45'-34.4" E
 - b. Angle format as above
 - c. Space between the direction and angle

1.3.33 CIRCLES

Detailing 1/8" diameter increments

1.3.34 ANGULAR DIMENSIONING

Start at 3/8" radius and increase in 1/8" increments

1.3.35 ELEVATION FORMATS

1. Deck and cap elevations are

- a. calculated to .0001 foot
 - b. detailed to 2 decimals
2. Footing elevations are detailed
 - a. Spread Footings and Cassions detailed as “EL XX.0 ± “
 - b. Pile Footings to 2 decimals (e.g. EL XX.00)
3. Minimum pile tip elevations, use the elevation as detailed in the BFI as follows:
 - a. If BFI Elevation is not a whole number, use the next lowest whole number
 - b. To whole number no decimals

1.3.36 NOTES

In general if there are several notes on a drawing:

1. All notes on a drawing should be located together, preferably above the title block.
2. Centered on the notes should be the title NOTES and underlined
3. Notes shall be numbered with a period sequentially
4. Line up text on second line. Like this note which is too long to fit on one line. Like this note which is too long to fit on one line.
5. Decimals to line up

When symbols are used with notes the note shall be near the symbol

1.3.37 TITLES

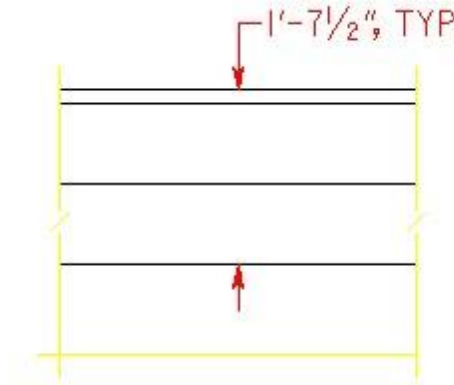
The titles for a section or detail shall be centered and ½” below the section or detail.

1.3.38 BREAKLINES

No uniform break line symbol has been made part of the GDOT Bridge cell Library. There are various accepted forms of the symbol used in the existing bridge cells. The Detailer should adopt one of these and use for details created from scratch. It is not necessary to change the symbol in the GDOT created cells to match.

1.3.39 USE OF TYPICAL

The format of Typical is ", TYP" and is placed at the end of text block or dimension.



1.3.40 QUOTE MARKS

To apply quote marks in notes and or dimensions use the following method. For opening quote marks use the TILDE (~) / GRAVE ACCENT (`) key located on the top row on the keyboard beside and to the left of the number one (1) / EXCLAMATION MARK (!) key. DO NOT HOLD DOWN THE SHIFT KEY. For the close quote mark use the standard QUOTE KEY (") / RIGHT SINGLE QUOTATION KEY (') located beside and to the left of the ENTER KEY on the middle row on the keyboard HOLD DOWN THE SHIFT KEY.

1.3.41 DRAWING SCALES

Detail all drawings/details using a standard (engineering or architectural) scale. Select a scale such that a half size drawing is clear and readable.

1.3.42 ENGINEERING SCALE

Engineering Scale shall be used for

1. Plan and Elevation Views on the Preliminary Layout and the Plan and Elevation Sheet.
2. Wall Envelopes

Engineering Scale may be used for Deck Plan detail

1.3.43 ARCHITECTURAL SCALE

Architectural Scale shall be used on all other details.

1.3.44 REFERENCE LINE

1. The Reference Line is the longitudinal line about which the structure is detailed. Do not use the Profile Grade Line as a Reference Line.
2. Roadway Plans may have many detailed longitudinal lines and some of these lines should be detailed on Structural Plans.
3. Locate the longitudinal line or lines needed to reference the structure to the Roadway Plans on the Preliminary Layout, Plan and Elevation Sheet and Typical Sections & Details. This Reference, such as the Construction Centerline, Profile Grade Line, Baseline and Existing Centerline.

This shall include the Reference Line, which is typically the centerline bridge.

4. On all remaining sheets or details, reference the structure to the Reference Line.
5. For example, on the Preliminary Layout, Plan View and the Plan and Elevation Sheet, Plan View detail and locate. On all remaining sheets or details, detail the structure about the Centerline Bridge.

2 BRIDGE AND WALL PLAN PRESENTATION

2.1 PURPOSE

The purpose of producing bridge and wall plans is to give clear and concise direction to the contractor regarding the location sequence and geometry at which the bridge or wall is to be constructed and the required structure type details.

2.2 GENERAL GUIDANCE

The following guidance and required practices are provided to the designer to assist in production of the individual drawings. It is by no means all inclusive and the engineer must use judgment in the preparation of the drawings. Items included below may not be applicable and may need to be augmented for any particular project.

2.3 REQUIRED PRACTICES

The following are required practices:

2.3.1 TITLE BLOCKS ON SHEETS

2.3.2 ROADWAY TITLE BLOCK – UPPER RIGHT CORNER

Leave blank – the GDOT Project Manager will add the

1. Project Number
2. Sheet No.

2.3.3 SHEET TITLE BLOCK – BOTTOM RIGHT CORNER

1. Always detail structure type and number above the Sheet Title Block
 - a. Single structure
 - i. BRIDGE NO. 1
 - ii. WALL NO. 1
 - b. Multiple structures

- i. If any details on the sheet apply to both structures, use both structure type and numbers
 1. BRIDGE NO. 1 LT AND RT
 2. WALL NO. 1 AND 2
 - ii. If every detail on the sheet applies to one structure, use just one structure type and number
 1. BRIDGE NO. 1 LT
 2. WALL NO. 2
2. Sheet numbering
 - a. The upper right roadway sheet number block is to be left blank
 - b. There are two sets of sheet numbers to the left of the main title block:
 - i. Drawing Number – Use Section 35 for bridges and 32 for walls. These numbers do not reset for each bridge or wall. This is required on all plans and ensures the plans will be assembled in the correct order.
 - ii. BRIDGE SHEET – These numbers reset for each bridge or wall.
3. Inside the Title Box
 - a. First Line: Sheet Name – use a name that describes most of the details on the sheet
 - i. PLAN AND ELEVATION
 - ii. DECK PLAN
 - iii. MISCELLANEOUS SUPERSTRUCTURE DETAILS
 - b. Second Line:
 - i. Site Description – whatever OVER whatever. Detail routes by number using the following order:
 1. CR County Road
 2. S Georgia S
 3. M Georgia M
 4. SR Georgia
 5. US Federal
 6. I Interstate
 - ii. If there is space the local route may be in parentheses – SR 140 (HOLCOMB BRIDGE ROAD) OVER LITTLE CREEK
 - c. Third line: County and Project Number
 - i. If the entire bridge is one county, list the county the bridge is in
 - ii. If the bridge is on the county line, list the counties in the same order as the Project Cover Sheet separated by a dash COUNTIES
 - iii. If bridge is on the state line, just GA or GA and the other State
4. Scale
 - a. SCALE: $\frac{3}{4}" = 1'-0"$ UNLESS NOTED

Select the scale that is used mostly and if a detail has a different scale, indicate the scale beneath the detail title.

b. SCALE: NONE

Basic sheets

c. SCALE: NONE UNLESS NOTED

Primary detail will show a scale under the title and other cells do not show scale

5. Initials – no periods, separate multiple people with a forward slash

a. Bridge

- i. Design
- ii. Drawn
- iii. Checked
- iv. Group
- v. Review
- vi. Approved

b. Consultants

- i. Design
- ii. Drawn
- iii. Checked
- iv. Liaison – GDOT Group Leader
- v. Review - Assistant State Bridge Engineer
- vi. Approved - State Bridge Engineer

6. Date

- a. same date on all drawings
- b. month (spelled out) year (no date, no comma) (e.g. MARCH 2007)
- c. Bridge office
 - i. Transmitted for review – the month and year submitted
 - ii. Transmitted for contract – date of PE signature
- d. Consultants
 - i. Transmitted for review – the month and year submitted, change for each submittal
 - ii. PE stamp and transmitted for contract – date of PE signature

2.4 CHECKLIST

Not Applicable

3 PRELIMINARY BRIDGE PLANS

3.1 PURPOSE

The preliminary bridge plans show the general layout and arrangement of the bridge, along with utilities, staging, hydraulics, and clearances. It is used to check that the bridge meets the overall needs of the project and as a control document for ongoing studies and plan development. The plans consist of, as a minimum, a Preliminary Layout and, if required, a construction sequence drawing. (Requirements for Construction Sequence drawings are discussed in the next section).

A Preliminary Layout is required for all bridges and is used to establish the basis for the Final Plans. They are required for the Preliminary Field Plan Review (PFPR) and used by GDOT Offices and the Districts to coordinate the work.

The Preliminary Plans are transmitted to other GDOT Offices and based on the type and location, to other offices outside GDOT.

The Preliminary Plans are used by other Offices for many different purposes:

1. Roadway, Urban or District Project Engineer – details the location and type of the structure.
2. Utility Office
 - a. Sent to Utility Companies for the Company to mark the location or existing or proposed utilities.
 - b. Sent to Railroads for approval
3. District Preconstruction Engineer – stake-out structure to make sure the structure fits the site that there are no conflicts
4. Geotechnical Bureau – to assist in obtaining BFIs or WFIs
5. FHWA – Full Oversight Projects, review and approval
6. Bridge Hydraulics

3.2 DRAWING ORDER

The following in sequential order is list of the drawing titles for the preliminary bridge plans.

Drawing Titles

- ☐ PRELIMINARY LAYOUT
- ☐ CONSTRUCTION SEQUENCE

4 PRELIMINARY BRIDGE PLANS: PRELIMINARY LAYOUT

4.1 PURPOSE

The Preliminary Layouts show the general layout and arrangement of the bridge, along with utilities, staging, hydraulics, and clearances. It is used to check that the bridge meets the overall needs of the project and as a control document for on-going studies and plan development.

4.2 GENERAL GUIDANCE

Scale - Use the largest common **engineering** scale

Stations and Profile Grade elevations shall be shown at each bent on the Elevation view on the Plan and Elevation Sheet. Following are the preferred methods for showing this information:

1. For single bridges and for parallel bridges where the BFPRs and bent centerlines are collinear and the profile is the same for both bridges, the station shall be at the intersection of the stationing line (usually construction centerline) and BFPR or the centerline of the intermediate bent. The elevation shall be the profile grade elevation at that station.
2. For parallel bridges where the BFPRs and bent centerlines are collinear but the bridges have separate profiles, the station shall be at the intersection of the stationing line (usually construction centerline) and BFPR or the centerline of the intermediate bent. The elevation shall be the profile grade elevation at that station for the right bridge, and a note so indicating shall be added to the plans.
3. For parallel bridges where the BFPRs and bent centerlines are not collinear, the right bridge shall be shown in the Elevation view. The station shall be at the intersection of the stationing line (usually construction centerline) and BFPR or the centerline of the intermediate bent for the right bridge. The elevation shall be the profile grade elevation for the right bridge at that station.
4. When one bridge is new and the other is existing, the new bridge shall be shown in the Elevation view and the stations and elevations for the new bridge shall be shown.
5. The note on the Elevation view shall read as follows: Stations shown are at the intersection of [stationing line] and BFPR or [centerline symbol] bent. Elevations are profile grade.

4.3 REQUIRED PRACTICES

There are standard practices that are required for the presentation of the preliminary layout. These deal primarily with the location of the information on the sheet.

- The plan view should appear in the top left corner of the sheet.
- The elevation view should appear directly below the plan view.
- "BRIDGE CONSISTS OF" appears in the top right corner of the sheet

Other information, including but not limited to, grade data, bench mark, horizontal curve data are located on the drawing based on availability of space and their traditional locations based on standard GDOT practice.

4.4 CHECKLIST

A checklist for the detailer's convenience is provided at the end of this manual. See Section 40.1

5 PRELIMINARY BRIDGE PLANS: CONSTRUCTION SEQUENCE

5.1 PURPOSE

The purpose of the construction sequence drawing is to present a graphical and narrative description of the way in which the designer has envisioned the construction of the bridge or retaining wall and staging of traffic. This sequence will control the design of individual objects as well as the detailing of reinforcing steel.

5.2 GENERAL GUIDANCE

Construction Sequence Drawing is required for bridge replacement projects that require staging of bridge construction or bridge widening.

The bridge staging numbers do not necessarily relate to roadway staging numbers.

Show limits of construction for each stage. Drop weight on parts of the bridge that were built in previous stages. It may be helpful to show one stage as the finished bridge.

Also show placement of traffic. Above the dimension line give the width available to traffic and below give the number and width of lanes, e.g. 37'-0" above the line and 3-11' LANES SOUTHBOUND. The difference between the two will be available for shoulders.

Temporary barrier should be in the stage before it is needed. If it is needed in Stage 2, show it being placed in Stage 1 even though it might be placed at the very end of Stage 1.

5.3 REQUIRED PRACTICES

On the left side of the drawing, detail deck sections for each stage of construction starting with the existing bridge.

On the right side of the sheet, provide notes that describe the removal/construction/maintenance activities involved with that stage of construction and any traffic shifts.

5.4 CHECKLIST

A checklist for the detailer's convenience is provided at the end of this manual. See Section 40.2 **Error! Reference source not found.**

6 PRELIMINARY WALL PLANS: PRELIMINARY WALL LAYOUT

6.1 PURPOSE

The Preliminary Wall Layouts show the general layout and arrangement of the wall, along with utilities, staging, and clearances. It is used to check that the wall meets the overall needs of the project and as a control the design of individual objects as well as the detailing of reinforcing steel.

6.2 GENERAL GUIDANCE

Scale - Use 1"= 10' for most plan views. Use 1"=10' for the elevation view.

Station numbers of the wall increase from left to right. Therefore if a wall is on the right of the mainline then the elevation view is drawing looking at back face of wall.

6.3 REQUIRED PRACTICES

There are standard practices that are required for the presentation of the preliminary wall layout. These deal primarily with the location of the information on the sheet.

- The plan view should appear in the top left corner of the sheet.
- The elevation view should appear directly below the plan view.
- "WALL CONSISTS OF" appears in the top right corner of the sheet

Other information, including but not limited to, grade data, bench mark, horizontal curve data are located on the drawing based on availability of space and their traditional locations based on standard GDOT practice.

6.4 CHECKLIST

A checklist for the detailer's convenience is provided at the end of this manual. See Section 40.3

7 FINAL BRIDGE PLANS

7.1 PURPOSE

Final Plans are required for the Final Field Plan (FFPR) and are used by the DEPARTMENT and their contractors to develop the bid, create a contract, and build the bridge.

7.2 DRAWING ORDER

The following in sequential order is list of the drawing titles for the bridge plans.

Drawing Titles

- PLAN AND ELEVATION
- GENERAL NOTES
- CONSTRUCTION SEQUENCE
- DECK PLAN
- DECK SECTIONS
- MISCELLANEOUS SUPERSTRUCTURE DETAILS
- SPECIAL DESIGN PARAPET DETAILS
- FRAMING PLAN
- BEAM SHEETS (IN SPAN ORDER)
- BEARINGS
 - NEOPRENE BEARING
 - POT BEARINGS
 - PLATE BEARINGS
- END BENT
- INTERMEDIATE BENT
- LAST END BENT (IF DIFFERENT)
- MISCELLANEOUS SUBSTRUCTURE DETAILS
- AS-BUILT FOUNDATION
- BAR REINFORCING SCHEDULE
 - SUPERSTRUCTURE FIRST (in span order),
 - SUBSTRUCTURE LAST (in bent order)]

8 PLAN AND ELEVATION

8.1 PURPOSE

Plan and Elevation Drawing is required and provides an overall view of the structure.

The Plan and Elevation Sheet includes

- a. Horizontal and vertical layout
- b. Depiction of Major components

8.2 GENERAL GUIDANCE

Typically, the Plan and Elevation sheet is created from the Preliminary Layout electronic file. The following information is presented based on the engineer modifying the Preliminary Layout to create the Plan and Elevation.

8.3 REQUIRED PRACTICES

There are standard practices that are required for the presentation of the Plan and Elevation. These deal primarily with the location of the information on the sheet.

- The plan view should appear in the top left corner of the sheet.
- The elevation view should appear directly below the plan view.

Other information, including but not limited to, grade data, horizontal curve data are located on the drawing based on availability of space and their traditional locations based on standard GDOT practice.

8.4 CHECKLIST

A checklist for the detailer's convenience is provided at the end of this manual. See Section 40.4

9 GENERAL NOTES

9.1 PURPOSE

The General Note Sheet provides the notes that are required for the construction of the bridge.

General Notes Drawing is always required and details the:

1. Design and construction parameters and specifications
2. Construction notes unique to the site
3. Summary of quantities
4. Direction given by the deck condition survey and salvage letter(s), if applicable.

The information is provided in the following headings:

1. BRIDGE CONSISTS OF
2. DRAINAGE DATA
3. TRAFFIC DATA
4. UTILITIES
5. RAILROAD REQUIREMENTS
6. GENERAL NOTES
7. DESIGN DATA
8. SUMMARY OF QUANTITIES

9.2 GENERAL GUIDANCE

The General Notes should be presented in a manner to make them easy to read and so as to utilize the available whitespace on the drawing.

9.2.1 NOTE PROGRAMS

Use the BRNOTES program available on the GDOT website to create the note file.

9.3 REQUIRED PRACTICES

Leave a blank line between each note to space the notes out on the sheet and make it easier to read.

Triple space the pay items in the list of quantities.

9.3.1 ARRANGEMENT OF SHEET

If the notes will fit on one drawing, arrange the notes on the drawing in three columns as follows:

<u>BRIDGE CONSISTS OF</u>	<u>GENERAL NOTES</u>	<u>DESIGN DATA</u>
<u>DRAINAGE DATA</u>		<u>SUMMARY OF QUANTITIES</u>
<u>TRAFFIC DATA</u>		
<u>UTILITIES</u>		
<u>RAILROAD REQUIREMENTS</u>		

If the notes will not fit onto one drawing, create a second sheet. Start the GENERAL NOTES in either the first or second column such that the last notes are in the third column.

The layout of the notes on the sheet should be as follows:

1. Centered at the top of each type of notes, place the title of the notes using 3/16" text underlined.
2. Do not use fractions like this: ½", use 1/2". Use FONT 49.

9.4 CHECKLIST

Not Applicable

10 CONSTRUCTION SEQUENCE

10.1 PURPOSE

The purpose of the construction sequence drawing is to present a graphical and narrative description of the way in which the designer has envisioned the construction of the bridge or retaining wall and staging of traffic. This sequence will control the design of individual objects as well as the detailing of reinforcing steel.

10.2 GENERAL GUIDANCE

The version of this sheet provided in the final plans will be essentially the same as what was provided in the preliminary plans. See Section 5 for more information.

11 SPECIAL DESIGN PARAPET OR RAILING DETAILS

11.1 PURPOSE

Special Design Parapet Drawings is used to provide the details needed to construct aesthetic parapets.

Currently, there are two aesthetic parapets that are accepted by Georgia DOT for use on projects with required aesthetic features. The approved special design parapets are:

1. "Texas Rail"
2. "Kansas Corral"

11.2 GENERAL GUIDANCE

Texas Rail parapet is characterized by a regular pattern of rectangular depressions or "windows" along its length to give a pleasing appearance at locations specifically selected by project requirements.

The uniform window patterns are fitted within the typical expansion joint segments in the parapet by adjusting the end spaces of each segment with variable spacings of 12-18 inches. These end spacings shall be uniform within a span, but may be different from adjacent spans to allow for different span lengths along the bridge.

Texas rails are to be used with GDOT approval only. Open windows in the railing are to be used for stream crossing bridges while rectangular depressions are used for grade separations.

Kansas Corral Rail is a side barrier characterized by a longitudinal beam supported by rectangular posts and serves as an alternative rail to a "jersey" style side barrier. It is intended for use in rural areas for aesthetic reasons.

Drawings for both rails are available from the Office of Bridge Design.

11.3 REQUIRED PRACTICES

11.3.1 TEXAS RAIL

The special design parapet detail sheet shall consist of a plan view, elevation view, sectional views, rustication detail at parapet "end post", reinforcing bar bend details, and tables for section lengths and reinforcing.

1. Plan View – Shall be a half-size detail located to the lower right of the drawing which shows the location of each parapet segment within the bridge.
2. Elevation View – Shall be a full-size detail located to the upper left of the drawing which shows the size of the windows, window spacing, end spacing, and segment spacing for both internal and end spans. The elevation view shall also show sectional locations through the windows and end sections.
3. Sectional Views – Shall be full-size details located to the left center and lower left of the drawing. A separate section will be required as follows: Longitudinal Section through parapet "end post",

Longitudinal section through parapet window, Partial top-down section through parapet “end post”, and Partial top-down section through interior end space post.

4. Rustication detail – Shall be exaggerated-size detail located where appropriate in the drawing showing width and depth of recess in parapet “end post”.
5. Reinforcing bar bend details – Shall be exaggerated-size detail located where appropriate in the drawing showing the bar types, leg lengths, and hook locations.
6. Reinforcing Schedule – Text Table located where appropriate in the drawing showing the information required for the contractor to purchase the reinforcing necessary for the parapet.
7. Section Length Table - Text Table located where appropriate in the drawing showing variable dimensions of parapet sections noted in the elevation view.

11.3.2 KANSAS CORRAL

This section under development, contact the Office of Bridge Design for current status.

11.4 CHECKLIST

See Section 40.5

12 DECK DRAINAGE SYSTEM DETAILS

12.1 PURPOSE

Hydraulic analysis and environmental considerations determine the need for a closed deck drain system.

12.2 GENERAL GUIDANCE

Consult the Bridge Design Office prior to detailing this item.

12.3 REQUIRED PRACTICES

The deck drain system shall be made of cast iron and/or PVC pipe Schedule 40 and consist of drains, drain pipes and clean outs and downspouts.

Call out material, hardware, and sizes of all components of deck drain system. This is important since there are not individual pay items for each component. The system must be detailed from the inlet to the outfall.

Include pipe hanger details and locations of hangers.

Show placement of drains on the deck plan sheet, with station.

Show vertical drop drain between beams, show bent drains over tops of beams. Adjust top of beam accordingly to fit drain in over it.

Show any additional reinforcement in deck required around deck drain.

12.4 CHECKLIST

See Section 40.6

13 CONCRETE BRIDGE SUPERSTRUCTURES

13.1 PURPOSE

The following sections of the manual (14 through 19) are specific to the detailing of concrete bridge superstructures, including bridges with cast-in-place concrete T beams and bridges with precast, prestressed concrete beams.

Consult with the Office of Bridge Design for guidance regarding Concrete Box Beam or Box Girder

14 CONCRETE SUPERSTRUCTURE: DECK PLAN

14.1 PURPOSE

The Deck Plan sheet is an overview of the superstructure by span. The drawing presents a graphical location of beams, diaphragms, edge beams, paving rests, endwalls, end posts, expansion joints and wingwalls and many of the critical controlling dimensions.

The Deck Plan sheet is the only location where the barrier segments are dimensioned and shown as well as the identity and placement of longitudinal deck reinforcement and barrier reinforcement.

Deck appurtenances such as barriers/parapets, sidewalks, handrails, fence posts, scupper holes, deck drains, raised medians, median barriers, deck taper geometry, utility centerlines, and any other unusual deck features are located on this sheet.

Quantities for superstructure concrete and reinforcing steel are presented in a quantity summary table on this sheet.

14.2 GENERAL GUIDANCE

The Deck Plan is located in the top left corner of the drawing and consists of a plan view for each unique span.

Transverse reinforcing bars are detailed full length in the reinforcing schedule; however, these bars are either cut in the field or fabricated to allow for skewed bridge bents.

If bridge bent has a skew angle that is 85 degrees or greater, transverse rebar is placed parallel to the bent.

If bridge bent has a skew angle that is 75 degrees or less (15 degrees or more measured from a radial line) then transverse bars are placed perpendicular to the centerline of bridge and skewed corner bars are added.

For spans with Bulb Tee beams, shade the top flange of the beams as to provide visual definition in the deck plan.

If all the required details will not fit on this sheet, add the remaining details to the additional deck plan sheets (if present) or to the Miscellaneous Superstructure Details Sheet.

14.2.1 SCALE:

Use appropriate Architectural Scale ($1/X'' = 1'-0''$) for this drawing.

14.2.2 DETAILS TO ADD TO THIS SHEET:

If space allows add the following details to this drawing, as required for detailing:

- Sections thru endwall, edge beam and diaphragm
- Joint details
- Chart of T1 & T2 for T beam spans
- Barrier/Parapet details
- Barrier Transition Details
- Expansion Joint in Barrier Detail
- Median details
- Drain details
- Skewed Corner Detail (if applicable)
- Bar Bending detail at Skewed Joint (if applicable)

14.2.3 DIAPHRAGMS:

Intermediate Diaphragms are placed perpendicular to the beam centerlines.

On skewed bridges, diaphragms must be located so that a line through the beam midpoints crosses the diaphragm at mid-bay. The result of this is that a beam with two sets of diaphragm holes will have the holes spaced the same distance from the midpoint of the beam. When bridges are skewed, but on a tangent section of roadway, you can usually show the distance to the diaphragms on the deck plan sheet.

For a bridge with a slight skew, the recesses for the 1" diameter rod may conflict with each other. Therefore, it is best to group diaphragms for slightly skewed bridges such that multiple diaphragms are collinear and one 1" diameter rod can be used in multiple bays.

14.3 REQUIRED PRACTICES

For tangent bridges, the detailer may use the Preliminary Layout MDL command to construct the main edges of the deck plan. All other features must be added per the previous guidelines regarding line type.

14.3.1 EPOXY COATED REINFORCEMENT (WHEN REQUIRED):

1. Use a "90" suffix on the bar designation to designate epoxy coated bars (i.e. 490).
2. Add the following notes under the SUPERSTRUCTURE QUANTITIES Table.

BARS P501 AND P701 IN THE END POST SHALL BE EPOXY COATED.
ALL 90 SERIES BARS SHALL BE EPOXY COATED.

14.3.2 BEAM NUMBERS:

1. Detail each beam number.
2. Number new beams from left most new beam/girder to the right starting with 1.
3. Number existing beams from left most existing beam/girder to right starting with 1 and using the suffix of "E". (e.g. BEAM 1, BEAM 2, BEAM 3, BEAM 1E, BEAM 2E, BEAM 3E, BEAM 4E, BEAM 5E, BEAM 4, BEAM 5)
4. Do not abbreviate BEAM.
5. Do not use the term PLATE GIRDER.
6. Do not use beams marks to detail the plans. (example: 101, 203, 304, etc.)

14.3.3 QUANTITY TABLES:

1. The description under ITEM shall be the same as the UNIT and PAY under the SUMMARY OF QUANTITIES on the General Notes Sheet.
2. All quantities shall be rounded as follows:
 - a. Concrete – nearest tenth of a cubic yard
 - b. Reinforcing Steel and Structural Steel – nearest pound
3. Use a TOTAL column in the SUPERSTRUCTURE QUANTITIES Table.
4. Do not divide quantities into Stages or Pours
5. Use commas (blank space)
6. Simple Span Quantities Table example:

SUPERSTRUCTURE QUANTITIES				
ITEM	SPAN 1	SPAN 2	SPAN 3	TOTAL
LUMP – CY SUPERSTR CONCRETE, CL AA	78.3	71.4	76.5	226.2
LUMP – LB SUPERSTR REINF STEEL	18,532	16,458	17,938	52,928
LUMP – LB STR STEEL	109,253	99,523	106,721	315,497

7. If multiple Deck Plan drawings are required, the quantity summary table should be shown on the first Deck Plan sheet.
8. Add the following notes under the quantity table:

ENDPOST CONCRETE AND BAR REINFORCING STEEL INCLUDED IN END SPAN QUANTITIES.
600 BARS INCLUDED IN SPAN X.

14.4 CHECKLIST

See Section 40.7

15 CONCRETE SUPERSTRUCTURE: DECK SECTIONS

15.1 PURPOSE

The Deck Sections sheet(s) include transversely and longitudinally cut sections and details from the superstructure of the bridge.

This sheet(s) should indicate locations of all components and reinforcement in the superstructure.

All unique sections, utilities that interact with the superstructure, and “D” dimensions should be indicated on this sheet(s).

15.2 GENERAL GUIDANCE

1. Computer software:
 - a. Use BRDECK or “Deck Sections Program” for assistance in detailing the majority of sections.
 - b. Use GDOT Bridge Cells as starting point of the majority of required details.
2. For wide bridges, break lines can be introduced in the deck section to minimize the width of bridge detailed as long as clarity of the drawing is not compromised.
3. For skewed bridges with diaphragms that are not collinear indicate that the 1” diameter bar is not continuous by exaggerating the location of the bars vertically to show that there are different bars from each side of the beam.

15.2.1 SCALE:

Use appropriate Architectural Scale (1/4”=1’-0” or 3/8”=1’-0”) for the Deck Sections portion of this drawing. Use “No Scale” for details.

15.3 REQUIRED PRACTICES

The Superstructure Sections and Details sheet(s) includes:

1. Superstructure Sections: series of transversely cut cross-sectional views through portions of the superstructure at the following locations (where applicable):
 - a. Section Thru Slab
 - b. Section Thru Diaphragm
 - c. Section Thru Endwall

- d. Section Thru Edge Beam
- 2. Superstructure Details:
 - a. Series of longitudinally cut cross-sectional views through portions of the superstructure at the following locations (where applicable):
 - i. Section Thru Diaphragm
 - ii. Section Thru Endwall (interior only, endwall section outside exterior beam is not required)
 - iii. Section Thru Edge Beam
 - iv. For RCDG (T-Beam) bridges only: Show a full longitudinal beam elevation which includes shear reinforcing spacing and main reinforcing bar cut-offs.
 - b. Crown Detail
 - c. Any necessary details pertaining to :
 - i. Barriers/Parapets
 - ii. Sidewalks
 - iii. Medians
 - iv. Joints
 - v. Fences
 - vi. Utilities/Hangers

If all the required details will not fit on this sheet, add the remaining details to the additional deck plan sheets or to the Miscellaneous Superstructure Details Sheet.

15.3.1 DIMENSIONS TO REFERENCE LINE:

All sections shall be referenced to the longitudinal line about which the plans are detailed.

15.3.2 DIAPHRAGM WITH BENT PLAIN BAR:

Any non-standard Plain Bars in the Diaphragm must be detailed and dimensioned independently. These pre-bent bars may be required to accommodate the passage of large utilities.

15.3.3 DIAPHRAGM, EDGE BEAM AND ENDWALL STIRRUPS UNDER PSC WIDE FLANGED BEAMS:

Nonstandard diaphragm, edge beam and endwall stirrup bars are required under the top flanges of wide flanged prestressed concrete beams (i.e. Bulb Tee's).

15.3.4 REINFORCEMENT AROUND UTILITY OPENINGS:

Voids for passage of utilities through diaphragms, edge beams and endwalls require reinforcing bars around the openings on both faces.

Use a closed circular stirrups for round openings and rectangular closed stirrups for non-circular openings.

Openings should be sized to clear the utility by 2" minimum on all sides. It is not necessary to clear the bell of bell and spigot pipes. Opening should allow for the skew of the utility with respect to the endwall or edge beam.

15.4 CHECKLIST

See Section 40.8

16 CONCRETE SUPERSTRUCTURE: MISCELLANEOUS SUPERSTRUCTURE DETAILS

16.1 PURPOSE

The Miscellaneous Superstructure Details Drawing is used only if there isn't sufficient space on the Plan and Elevation, Deck Plan and/or Deck Sections Drawings for the complete detailing of the superstructure.

16.2 GENERAL GUIDANCE

Many of these details are in the Bridge Cell Library. If additional details are needed, the detail shall consist of all the outlines, dimensions, reinforcement and notes needed for construction.

16.3 REQUIRED PRACTICES

Place details in groups of similar details. (e.g. place BARRIER TRANSITION DETAIL, BARRIER DETAIL and 1" EXPANSION JOINT IN BARRIER either side by side or one above the other).

16.4 CHECKLIST

Not applicable

17 CONCRETE SUPERSTRUCTURE: BEAM LAYOUT

17.1 PURPOSE

The Beam Layout sheet (also known as a “framing plan”) is a supplement to the Deck Plan sheet and is required to be used to define the layouts of the beams, diaphragms and/or cross frames when any of the following situations are present:

1. Any portion of the bridge is in a horizontal curve.
2. The beam layout is by coordinates.
3. The beam layout is "complex".

17.2 GENERAL GUIDANCE

List of required Components:

See Section 35.002.B.9 Framing Plan Drawing of the “Plan Checklist Document” for the list of required components for this drawing.

Details shall include:

- BFPR
- Centerline Bent
- Centerline Beam
- Diaphragm
- Angles of intersection between:
 - BFPR and Centerline Beam
 - Centerline Bent and Centerline Beam
 - Centerline Beam and Diaphragm
- Description of the beam layout
- Reference Line

17.3 REQUIRED PRACTICES

All dimensions shall be feet to 2 decimals.

17.4 CHECKLIST

See Section 40.9

18 CONCRETE SUPERSTRUCTURE: PSC BEAM DETAILS

18.1 PURPOSE

The Beam sheet is used to define beam details, dimensions, reinforcement, and material properties based on the GDOT standard sheets that define AASHTO Type I Mod. - III and Bulb Tee beams.

A unique beam sheet is required for each beam type or unique strand pattern used in a set of bridge plans.

18.2 GENERAL GUIDANCE

List of required Components:

Each Beam sheet shall be based on the Office of Bridge and Structural Design's Basic Drawings for the appropriate AASHTO or Bulb Tee Basic Drawing. These basic drawings are provided for AASHTO Standard PSC beams (Type I Mod., II, III, IV or V) and Bulb Tee PSC beams (54", 63" or 72").

Scale:

These Basic Drawings are not drawn to scale. "No Scale" is indicated on the drawings.

18.3 REQUIRED PRACTICES

Add the following cells to this drawing when applicable:

1. Recess Detail for Diaphragm Bar Ends
2. Bevel Details (for top flange beveling) Make sure to choose the detail most representative of the correct bridge skew

Revise Basic Drawing when needed to indicate location of:

1. Total number of strands
2. Draped strands
3. Strand type
4. Diaphragm hole locations
5. Strand hold down location

For uniformly dimensioned beams, fill in dimensions on the elevation view. For multiple similar beams with differing dimensions, add a "table of lettered dimensions".

Dimensions shall be in feet, inches, and fractions of inches (no smaller than 1/16" increments).

Revise all notes to include actual values of design and material properties.

Indicate actual non-composite and composite deflections. Composite deflection does not include the deflection due to the overlay.

Indicate actual stirrup quantity and spacing along elevation view.

Remember to check the shear reinforcing indicated at the end of the beam to be sure it is sufficient for the design requirements. If changes to the shear reinforcement bar size are necessary, be sure to coordinate the changes with the beam sections shown on the drawing. (Elevation View, Section at End of Beam and the Reinforcing Bar Details)

18.4 CHECKLIST

A checklist for the detailer's convenience is provided at the end of this manual. See Section 40.10

19 CONCRETE SUPERSTRUCTURE: NEOPRENE BEARING DETAILS

19.1 PURPOSE

The Bearing Sheet is used to define and dimension the bearings used in the concrete (cast-in-place or prestressed beam) bridge design.

19.2 GENERAL GUIDANCE

List of required Components:

Each Bearing sheet shall be based on the Office of Bridge and Structural Design's Basic Drawings for the following neoprene bearing applications:

PSC beams without shim plates

PSC Beams with shim plates

RCDG Beams

A unique detail must be used for each application:

Bearings of same type but different dimensions may be defined on the same sheet with a "table of lettered dimensions

If a superstructure has a combination of different beam types (PSC BEAMS, RCDG), the detail should combine the bearing details to one sheet if possible. Designate the different pads using letter designations (i.e. PAD "A", PAD "B" ...)

19.3 REQUIRED PRACTICES

Use the appropriate skew detail and eliminate the non-applicable skew details

Use the appropriate bevel detail and eliminate the non-applicable bevel details

Revise table of lettered dimensions for each unique bearing, defining:

- Overall Dimensions
- Number of Internal Plates
- Design Properties
- Shim Plate Dimensions

Ensure the "Notes" portion of this drawing follows all current specifications and practices.

19.4 CHECKLIST

See Section 40.11

20 STEEL BRIDGE SUPERSTRUCTURE

20.1 PURPOSE

The following sections of the manual are specific to the detailing of steel bridge superstructures, including bridges with rolled beams and bridges with plate girders.

Consult with the Office of Bridge Design for guidance regarding Steel Box Beam bridges.

21 STEEL SUPERSTRUCTURE: DECK PLAN

21.1 PURPOSE

The Deck Plan sheet is an overview of the superstructure by span. The drawing presents a graphical location of beams, edge beams, paving rests, endwalls, endposts, expansion joints and wingwalls and many of the critical controlling dimensions.

The Deck Plan sheet is the only location where the barrier segments are dimensioned and shown as well as the identity and placement of longitudinal deck reinforcement and barrier reinforcement.

Deck appurtenances such as barriers/parapets, sidewalks, handrails, fence posts, scupper holes, deck drains, raised medians, median barriers, deck taper geometry, utility centerlines, and any other unusual deck features are indicated on this sheet.

Quantities for superstructure concrete, reinforcing steel and structural steel are presented in a quantity summary table on this sheet.

21.2 GENERAL GUIDANCE

The Deck Plan is located in the top left corner of the drawing and consists of a plan view for each unique span.

Transverse reinforcing bars are detailed full length in the reinforcing schedule; however, these bars are either cut in the field or fabricated to allow for skewed bridge bents.

If bridge bent has a skew angle that is 85 degrees or greater, transverse rebar is placed parallel to the bent.

If bridge bent has a skew angle that is 75 degrees or less (15 degrees or more measured from a radial line) then transverse bars are placed perpendicular to the centerline of bridge and skewed corner bars are added.

If all the required details will not fit on this sheet, add the remaining details to the additional deck plan sheets (if present) or to the Miscellaneous Superstructure Details Sheet.

21.2.1 SCALE:

Use appropriate Architectural Scale ($1/X'' = 1'-0''$) for this drawing.

21.2.2 DETAILS TO ADD TO THIS SHEET:

If space allows add the following details to this drawing, as required for detailing:

- Sections thru endwall, edge beam and diaphragm
- Joint details
- Barrier/Parapet details
- Barrier Transition Details
- Expansion Joint in Barrier Detail
- Median details
- Drain details
- Skewed Corner Detail (if applicable)
- Bar Bending detail at Skewed Joint (if applicable)

21.3 REQUIRED PRACTICES

For tangent bridges, the detailer may use the Preliminary Layout MDL command to construct the main edges of the deck plan. All other features must be added per the previous guidelines regarding line type.

21.3.1 EPOXY COATED REINFORCEMENT (WHEN REQUIRED):

1. Use a "90" suffix on the bar designation to designate epoxy coated bars (i.e. 490).
2. Add the following notes under the SUPERSTRUCTURE QUANTITIES Table.

BARS P501 AND P701 IN THE END POST SHALL BE EPOXY COATED.

ALL 90 SERIES BARS SHALL BE EPOXY COATED.

21.3.2 BEAM NUMBERS:

1. Detail each beam number.
2. Number new beams from left most new beam/girder to the right starting with 1.
3. Number existing beams from left most existing beam/girder to right starting with 1 and using the suffix of "E". (e.g. BEAM 1, BEAM 2, BEAM 3, BEAM 1E, BEAM 2E, BEAM 3E, BEAM 4E, BEAM 5E, BEAM 4, BEAM 5)
4. Do not abbreviate BEAM.
5. Do not use the term PLATE GIRDER.
6. Do not use beams marks to detail the plans. (example: 101, 203, 304, etc.)

21.3.3 QUANTITY TABLES:

1. The description under ITEM shall be the same as the UNIT and PAY under the SUMMARY OF QUANTITIES on the General Notes Sheet.
2. All quantities shall be rounded as follows:
 - a. Concrete – nearest tenth of a cubic yard
 - b. Reinforcing Steel and Structural Steel – nearest pound
3. Use a TOTAL column in the SUPERSTRUCTURE QUANTITIES Table.
4. Do not divide quantities into Stages or Pours
5. Use commas (blank space)
6. Simple Span Quantities Table example:

SUPERSTRUCTURE QUANTITIES				
ITEM	SPAN 1	SPAN 2	SPAN 3	TOTAL
LUMP – CY SUPERSTR CONCRETE, CL AA	78.3	71.4	76.5	226.2
LUMP – LB SUPERSTR REINF STEEL	18,532	16,458	17,938	52,928
LUMP – LB STR STEEL	109,253	99,523	106,721	315,497

7. If multiple Deck Plan drawings are required, the quantity summary table should be shown on the first Deck Plan sheet.
9. Add the following notes:

ENDPOST CONCRETE AND BAR REINFORCING STEEL INCLUDED IN END SPAN QUANTITIES.

600 BARS INCLUDED IN SPAN X.

21.4 CHECKLIST

See Section 40.12

22 STEEL SUPERSTRUCTURE: SLAB POUR SEQUENCE

22.1 PURPOSE

The slab pour sequence sheet depicts the required pour sequences and directions.

Depict, in plan view the individual pours numbered by sequence.

22.2 GENERAL GUIDANCE

22.3 REQUIRED PRACTICES

Add the following notes:

- ☐ No pour shall be placed until previously placed pour has achieved 2500 PSI strength
- ☐ After placement of the first pour, succeeding pours shall begin at the end farthest away from and proceed toward the previously placed pour. Arrows on the pour sequence indicate direction of placement.
- ☐ Pours shall be placed in order indicated on the pour sequence diagram.

23 STEEL SUPERSTRUCTURE: DECK SECTIONS

23.1 PURPOSE

The Deck Sections sheet(s) include transversely and longitudinally cut sections and details from the superstructure of the bridge.

This sheet(s) should indicate locations of all components and reinforcement in the superstructure.

All unique sections, utilities that interact with the superstructure, and “D” dimensions should be indicated on this sheet(s).

23.2 GENERAL GUIDANCE

1. Computer software:
 - a. Use BRDECK or “Deck Sections Program” for assistance in detailing the majority of sections.
 - b. Use GDOT Bridge Cells as starting point of the majority of required details.
2. For wide bridges, break lines can be introduced in the deck section to minimize the width of bridge detailed as long as clarity of the drawing is not compromised.

23.2.1 SCALE:

Use appropriate Architectural Scale (1/4”/ft or 3/8”/ft) for the Deck Sections portion of this drawing. Use “No Scale” for details.

23.3 REQUIRED PRACTICES

The Superstructure Sections and Details sheet(s) includes:

1. Superstructure Sections: series of transversely cut cross-sectional views through portions of the superstructure at the following locations (where applicable):
 - a. Section Thru Slab
 - b. Section Thru Diaphragm
 - c. Section Thru Cross Frame
 - d. Section Thru Edge Beam
2. Superstructure Details:

- a. Series of longitudinally cut cross-sectional views through portions of the superstructure at the following locations (where applicable):
 - i. Section Thru Edge Beam
- b. Crown Detail
- c. Any necessary details pertaining to :
 - i. Barriers/Parapets
 - ii. Sidewalks
 - iii. Medians
 - iv. Joints
 - v. Fences
 - vi. Utilities/Hangers

If all the required details will not fit on this sheet, add the remaining details to the additional deck plan sheets or to the Miscellaneous Superstructure Details Sheet.

23.3.1 DIMENSIONS TO REFERENCE LINE:

All sections shall be referenced to the longitudinal line about which the plans are detailed.

23.3.2 REINFORCEMENT AROUND UTILITY OPENINGS:

Voids for passage of utilities through edge beams require reinforcing bars around the openings on both faces.

Use a closed circular stirrups for round openings and rectangular closed stirrups for non-circular openings.

Openings should be sized to clear the utility by 2" minimum on all sides. It is not necessary to clear the bell of bell and spigot pipes. Opening should allow for the skew of the utility with respect to the edge beam.

23.4 CHECKLIST

See Section 40.13

24 STEEL SUPERSTRUCTURE: MISCELLANEOUS SUPERSTRUCTURE DETAILS

24.1 PURPOSE

Miscellaneous Superstructure Details Drawing is used only if there isn't enough space on the Plan and Elevation, Deck Plan and/or Deck Sections Drawings for the additional superstructure details.

24.2 GENERAL GUIDANCE

Many of these details are in the Bridge Cell Library. If additional details are needed, the detail shall consist of all the outlines, dimensions, reinforcement and notes needed for construction.

24.3 REQUIRED PRACTICES

Place details in groups of similar details. (e.g. place BARRIER TRANSITION DETAIL, BARRIER DETAIL and 1" EXPANSION JOINT IN BARRIER either side by side or one above the other).

24.4 CHECKLIST

See Section 40.14

25 STEEL SUPERSTRUCTURE: STEEL BEAM DETAILS

25.1 PURPOSE

The steel beam sheet(s) is used to define beam details, dimensions, reinforcement and material properties for simple span and continuous bridges where the superstructure consists of steel beams with a reinforced concrete deck.

Steel beams for this kind of structure are characterized as one of three major types.

1. Simple span bridges built using multiple standard “W” section rolled beams as the primary longitudinal load carrying elements.
2. Simple span or multiple continuous span bridges built using beams fabricated from common rolled sections including plates and beams as the primary load carrying elements. Such beams are usually fabricated as “I” sections from ‘W” section rolled beam, “W” section beams with cover plates or welded plate girders built from steel plate. Note that the terms “girder”, “built-up girder”, “built-up beam” and “welded plate girder” all refer to the manufacture of fabricated beams covered by this section of the manual.
3. Simple span or multiple continuous span bridges built using beams fabricated as steel box girders or “tubs” (steel box with concrete top flange) may be used for special situations, including bridges built to significant horizontal curvature – consult with the Bridge Office before beginning work involving this type of structure and whenever significant horizontal curvature is present.

25.2 GENERAL GUIDANCE

Title

The sheet is entitled as follows:

Steel Beam Details

or Steel Beam Details, Span(s) _____, _____, & _____

or Continuous Beam Details

or Continuous Beam Details, Spans _____, _____ & _____

Scale

Label the sheet as having “No Scale”

Draw the details to an engineering scale that horizontally best fits the span or unit to the full width of the sheet. Use an exaggerated scale vertically to depict plan & elevation details as clearly as is possible.

25.3 REQUIRED PRACTICES

The basic sheet element is an Elevation View required for each span or section of beam and located across the top of the drawing depicting:

- Top flange
- Web
- Bottom flange
- Bearing and web stiffeners.
- Centerlines of bearing and BFPR

The elevation shall show all critical dimensions including:

- Top plates
- Web plates
- Bottom plates
- Stiffener plates
- Nominal girder length (Centerline Bent or BFPR to Centerline Bent or BFPR).
- Fabrication girder length (end to end)
- Dimensions to plate size change location, transition from prismatic to variable depth sections, etc.
- Location of bearing & web stiffeners
- Spacing & location of shear studs
- Location of shop and field splices

Additional required details on the elevation includes the weld sizes & locations, bending radius for bottom flange plates at web depth transition locations and designation of fracture critical elements (flagged with a Charpy V Notch “CVN” label).

Notes to be Provided

- Add a note regarding the CVN label
- Define steel properties for all elements

Optional Practices

For skewed or curved bridges and where individual beam dimensions vary draw the elevation at nominal length and use a reference ID and table of dimension to provide full dimensions for all girders of the span. The table of dimensions may be placed on the steel girder sheet or on a sheet that follows the steel girder sheets.

If necessary, additional clarification shall be provided by the addition of top and bottom flange plan views above and below the elevation view.

Girder Grade & Camber Details

Girder Grade & Camber Details must be provided. The information can be provided on the girder sheet if room is available or on a separate sheet that follows the girder sheets.

The information provided shall be extracted from a GDOT approved software program and shall provide the anticipated deflections at every 1/10th of the girder due to the following:

- Self Weight deflection (due to all steel erected as a continuous unit)
- Self weight deflection (due to concrete deck pours).
- Superimposed dead load deflection due to sidewalk and parapets placed on the completed composite bridge.
- Total deflection due to all effects summarized over the erection cycle of the bridge.

If the plans depict a series of pours then individual tabulation shall be provided for deflections due to each pour with the complete model modified to include the stiffness of the composite deck already poured as future pours are made.

The information shall be predicted in graphical and tabulated format and for skew or curved span and shall be provided for all beams within the span.

If space dictates the table of deflection dimensions may be placed below the graphical depictions or may be included as a separate sheet that follows the graphical depictions.

In addition, a girder grade and camber ordinate diagram and data tabulation shall be provided.

The grade and camber diagrams combine the required final vertical curvature of the bridge with the camber to be built in to offset the predicted deflections and adjusts the data to show the required shape of each individual shop length of girder (between shop and field splice points).

This is critical information that will be used by the beam fabricator to set up the shape and end cut geometry of shop fabrications.

25.4 CHECKLIST

See Section 40.17

26 STEEL SUPERSTRUCTURE: BUTT JOINT DETAILS

26.1 PURPOSE

Use to define the requirements for required shop and field splices of steel girders.

26.2 GENERAL GUIDANCE

All splices for steel girders shall be detailed as fully welded splices using the Butt Joint, Basic Drawing Sheet. Review the sheet for adequacy for the intended purpose, removing any irrelevant details. In general, no modification or enhancement is required.

26.3 REQUIRED PRACTICES

Scale No scale

27 STEEL SUPERSTRUCTURE : STRUCTURAL STEEL DETAILS

27.1 PURPOSE

This sheet is used to depict miscellaneous details of some or all of the following:

1. Bearing Stiffeners
2. Diaphragm Details
3. Cross Frame Details
4. Lateral Bracing Details (if any)
5. Shear Stud Details
6. Bearing Details

Scale

No scale.

Show an architectural scale for each detail presented that provides good clarity when the drawing is reduced to half size.

27.2 GENERAL GUIDANCE

Cross Frames & Stiffeners

Detail gusset plates, frame members and connection details including all welded and bolted connections. Fully define member sizes but member lengths are better left for the fabricator to calculate and submit in the Shop Drawing Review process. Show bolt and bolt hole sizes, weld types and sizes, gusset plate clips and any required construction details.

Cross Frames are typically K-Type or X-Type (for deeper girders). Typical details for cross frames are available from the Bridge Office and should be used as the basis for drawing development.

See examples that follow.

Diaphragms

Diaphragms are typically channel sections bolted to gusset plates during erection and welded before the deck is poured. Detail gusset plates, channel member size, bolt & bolt hole sizes, weld type, size and location, and any required construction details. Diaphragms standard details are available in the GDOT cell library.

Shear Stud Connector Detail

Show Pitch, transverse spacing, stud size and length.

27.3 CHECKLIST

See Section 40.14

28 STEEL SUPERSTRUCTURE: BEAM LAYOUT

28.1 PURPOSE

The Beam Layout sheet (also known as a “framing plan”) is a supplement to the Deck Plan sheet and is required to be used to define the layouts of the beams, diaphragms and/or cross frames when any of the following situations are present:

1. Any portion of the bridge between the BFPR to BFPR is on the horizontal curve.
2. The beam layout is by coordinates.
3. The beam layout is "complex".

28.2 GENERAL GUIDANCE

List of required Components:

See Section 35.002.B.9 Framing Plan Drawing of the “Plan Checklist Document” for the list of required components for this drawing.

Details shall include:

- BFPR
- Centerline Bent
- Centerline Beam
- Diaphragm
- Angles of intersection between:
 - BFPR and Centerline Beam
 - Centerline Bent and Centerline Beam
 - Centerline Beam and Diaphragm
- Note indicating a description of the beam layout methodology
- Reference Line

28.3 REQUIRED PRACTICES

All dimensions shall be feet to 2 decimals.

28.4 CHECKLIST

See Section 40.16

29 STEEL SUPERSTRUCTURE: NEOPRENE BEARING DETAILS

29.1 PURPOSE

The Bearing Sheet is used to define and dimension the bearings used in the steel beam bridge design.

29.2 GENERAL GUIDANCE

If the designer proposes to use neoprene bearings with steel beams, detailer shall produce a drawing depicting the bearing to be used and its connection to the beam and substructure for approval by the Office of Bridge Design. For in-house work GDOT does not use neoprene bearings, so there are no go-by's or guidelines available.

Bearings of same type but different dimensions may be defined on the same sheet with a "table of lettered dimensions"

29.3 REQUIRED PRACTICES

Provide a table of lettered dimensions, as needed, for each unique bearing, defining:

- Overall Dimensions
- Number of Internal Plates
- Design Properties

Ensure the "Notes" portion of this drawing follows all current specifications and practices.

29.4 CHECKLIST

No checklist available

30 STEEL SUPERSTRUCTURE: STEEL PLATE BEARING DETAILS

30.1 PURPOSE

The Steel Plate Bearing Details Sheet is used to detail and dimension the steel fabricated plate bearings used in the steel beam bridge design. Plate bearings consist of bearing plates and sole plates; and may include neoprene sheet under the sole plates. In addition, longer span expansion bearings will include self-lubricating bronze plates.

30.2 GENERAL GUIDANCE

Every unique plate bearing type and size is fully detailed and dimensioned on the Bearing Details Sheet.

30.3 REQUIRED PRACTICES

Individual plate bearing components shall be detailed. These details shall include member sizes and material properties.

Provide bearing assembly details for each type, size, and location of bearing showing the full bearing assembly on the cap in plan and elevation view.

Provide notes specifying material properties for the bearing and sole plates, self-lubricating bronze plates, anchor bolts, and washers and nuts. Ensure the “Notes” portion of this drawing follows all current specifications and practices.

Provide individual plate or neoprene pad details including plan and elevation views for each unique plate or neoprene pad. Include overall size, thickness, hole or slot size, and hole or slot location.

30.4 CHECKLIST

A checklist for the detailer’s convenience is provided at the end of this manual. See Section 40.18

31 BEARINGS: POT BEARING DETAILS

31.1 PURPOSE

To depict the general characteristics and dimensions of the pot bearing assumed in the design and to state the required forces, displacements and rotations required of the bearing.

31.2 GENERAL GUIDANCE

Use the basic drawing sheet for pot bearings and modify the “Design Data” table with actual forces and preliminary dimensions for each location. Review the sheet for adequacy for intended purposes.

31.3 REQUIRED PRACTICES

If the designer proposes to use pot bearings, he shall contact Office of Bridge Design for approval prior to commencing final design.

Use the appropriate Pot Bearing Details basic drawing based on freedom of movement required.

Bearings of same type but different dimensions may be defined on the same sheet with a “table of lettered dimensions

Scale No Scale

31.4 CHECKLIST

No checklist is available

32 END BENT

32.1 PURPOSE

The End Bent Sheet consists of the Plan, Elevation, and Sectional details of the first and last bents including quantities and Pile Driving information.

32.2 GENERAL GUIDANCE

Run the BREBNT Program.

The overall layout of this drawing will present a plan view in the top left of the drawing and an elevation view below. The elevation view will be a vertical projection of the plan view and be shown looking back for bent 1.

32.3 REQUIRED PRACTICES

Detail dimensions to nearest 1/8" unless noted otherwise.

Use 3/8" scale, if possible, but in any case no smaller than 1/4" scale

Detail Elevations to nearest .01 (hundredth) of a foot.

If end bents are similar, a separate drawing is not required. Locate a half-scale schematic of the plan and elevation views for the ahead end bent to the lower left of the drawing showing the following:

- Station of BFPR
- Cap elevations
- Beam numbers and centerlines
- Skew angle
- Other pertinent elevations (i.e. wing wall elevations, bottom of cap, etc.)

Do not use a Table of Lettered Dimensions for end bents. Label the elevations on the elevation view.

In the title block, the drawing name shall be "Bent X" or "Bents X and X"

PLAN VIEW

Caps

Caps are typically 3' wide by 2' (minimum) tall in cross section.

Fillets at wing walls are created by locating the intersection points along the back face of the cap and inside wing wall that are at a 2' offset from the inside wing wall and back face of cap. With extreme skews these offsets may need to be increased.

Cap steps lengths are typically detailed to the nearest 1" increment, fractional remainders can be accommodated in either outermost step. Construction Joints shall be located at cap steps and are to be perpendicular to the cap. See Design Manual Section 4.2.2

Locate Dimension strings below the Plan View of the Cap and measure along the front face of the cap.

Typically three strings of dimensions are shown:

- Beam Centerlines (Dimension string closest to the cap)
- Cap Steps
- Overall length

Typical Reinforcing:

<u>410</u> (Type 32 in cap, over piles)	
	for 2'x 3' typical end bent:
A, G: 4 ½", style 5 hook	A, G: 4 ½", style 5 hook
B: Cap Width less 4" (2x 2" clear)	B=2'-8"
C, D: Cap Depth less 4" (2x 2" clear)	C, D = 1'-8"
Use 4 bars over each pile	Length= 6'-9"

<u>411</u> (Type 25 in cap, between piles and at end of cap)	
	for 2'x 3' typical end bent:
A, G: 4 ½", style 4 hook	A, G: 4 ½", style 4 hook
B: Cap Width less 4" (2x 2" clear)	B=2'-8"
C: Cap Depth less 4" (2x 2" clear)	C = 1'-8"
Spaced at +/- 12"	Length= 9'-5"

610 Type 1 in Fillet between end bent and wingwall. The drawing program will label these "TMB" which stands for Top, Middle and Bottom.

Length approximately from center of wingwall to centerline of bent. (Often measured in the CAD drawing)

If bridge is skewed, left and right sides will be different. (Check to make sure bar does not conflict with piling.)

3 bars each side, 6/bent.

1010 Longitudinal bars in cap.

90° End bent: Type 2

B: Inside Face wingwall to Inside Face wingwall +12" (2x6" into wingwall)

C, D: 1'-10" (typical hook length)

Skewed End bent: Type 6

B: Inside Face wingwall to Inside Face wingwall + 6" into wingwall

C: 6"

D, E: 1'-10"

Phi: 90-Skew

N: Skew

Bars over 60' Long require a Class B splice.

Typically 4 bars/bent, but more for wider caps

Wingwalls

Wingwalls are typically 12" wide.

Detail wing wall length to the nearest 3 inch increment and elevation to nearest .01 ft, See Design Manual Section 4.2.3

Typical Reinforcing:

510 Type 1, vertical in Wing Wall

Length: Height of Wing Wall less 4" (2 x 2" clearance)

Spaced at +/- 12"

511 Type 1, horizontal in Wing Wall

Length: Length of Wing Wall less 4" (2 x 2" clearance)

Spaced at +/- 12"

Pile Boxes (if necessary)

Pile Boxes are required for longer wingwalls (See Design Manual).

When required, Pile Boxes are typically 2'-6" square by 2'-0" tall.

Size Pile boxes per the size of pile used in the box. Piles in excess of 18" will require a box greater than 2'-6" square.

Reinforcing shall be one #4 vertical bar in each corner surrounded by 3-#4 stirrups at equal vertical spacing.

Typical Reinforcing:

412 Type 25 in pile box (2'-6" X 2'-6" typ. Box)

A, G: 4 ½" style 4 hook

B: 2'-6" less 4" (2 x 2" cl.) = 2'-2"

C: 2'-6" less 4" (2 x 2" cl.) = 2'-2"

Length = 9'-5"

3 bars/box

413 Type 1 in Pile box.

Length: 2'-0" high box - 4" (2 x 2" cl) = 1'-8"

4 bars/box

ELEVATION VIEW

For Bent 1, Elevation View shall be detailed with "**(LOOKING BACK)**" under the title.

For the Last Bent, Elevation View shall be detailed with "**(LOOKING AHEAD)**" under the title.

For skewed bents, remember to show the projected view of the wingwalls (and pile boxes).

Show labeled Section cuts through the cap between piles and at a pile.

SECTION VIEWS

There are typically two end bent Section views shown in the plans.

The sections shall be located to the upper right of the drawing.

Section views shall be detailed at twice the scale of the elevation view.

Typically these sections are:

- Section A-A = Section between piles.
- Section B-B = Section at pile

For bridges with fascia beams, detailing the difference in cap height and the additional reinforcement in this “riser” will require additional sections.

Do not cut sections through the wingwall or pile box.

PLAN DRIVING OBJECTIVE

Locate the Plan Driving Objective to the lower right, directly above the title block.

QUANTITY TABLE

Locate a quantity table in the lower right of the drawing, but left of the Plan Driving Objective.

The description under ITEM shall be the same as the UNIT and PAY under the SUMMARY OF QUANTITIES on the General Notes Sheet.

All quantities shall be rounded as follows:

- Concrete – nearest tenth of a yard
- Reinforcing Steel – nearest whole number

Use commas to indicate thousands.

Bent Table example:

SUBSTRUCTURE QUANTITIES	
ITEM	BENT 1
CY CLASS AA CONCRETE	78.3
LB BAR REINF STEEL	18,532

NOTES

Locate end bent notes to lower left of drawing, above the sheet border.

32.4 CHECKLIST

See Section 40.19

33 INTERMEDIATE BENT

33.1 PURPOSE

The Intermediate Bent Sheets consist of all the information needed to construct all the bents located between the end bents.

33.2 GENERAL GUIDANCE

Run the BIBNT (Concrete Bent) Program.

The overall layout of this drawing will present a plan view in the top left of the drawing and an elevation view below. The elevation view will be a vertical projection of the plan view and be shown looking ahead.

If all intermediate bents are similar enough to not require a separate drawing variable dimensions may be tabulated.

33.3 REQUIRED PRACTICES

Use 3/8" scale, if possible, but in any case no smaller than 1/4" scale.

Detail dimensions to nearest 1/8" unless noted otherwise.

Detail Elevations to nearest .01 (hundredth) of a foot.

In the title block, the drawing name shall be "Bent X" or "Bents X and X".

PLAN VIEW

The plan view is used to describe the horizontal layout of the bent and centerlines of bearing. The plan view shall be located at the upper left of the sheet.

Caps

The centerline of bent shall be shown in relation to the bridge reference line (station or station/offset), including the skew angle.

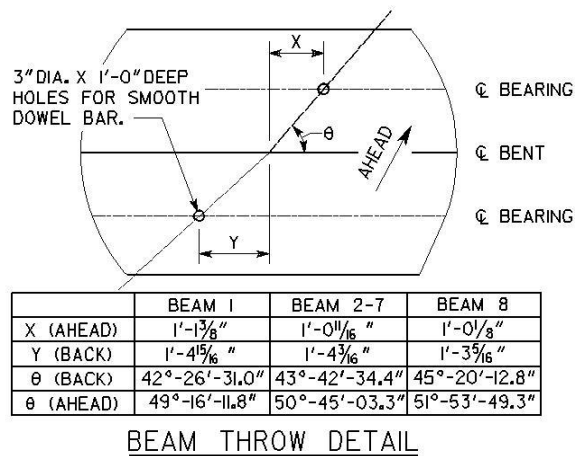
The centerlines of bearing shall be shown in relation to the centerline of bent.

The angle between the centerline of bearing and beam centerline shall be shown.

The centerline of beams shall be shown in relation to the bridge reference line or limits of cap (whichever is most practical).

Cap steps shall be detailed in reference to the limits of the cap. Cap steps are typically detailed to the nearest whole inch increment, fractional remainders can be accommodated in either outermost step.

Smooth Dowel holes and 1013 dowels shall be located in the cap plan view. If bridge is skewed, a beam “throw” detail may be helpful. Use an angle label of alpha for ahead and beta for back (α and β)



ELEVATION VIEW

The elevation view is used to show the relationship between the cap, columns, and foundations. Cap step elevations and major reinforcing are also detailed in this view.

The intermediate bent elevation view shall be detailed LOOKING AHEAD.

Cap step elevations shall be shown.

Bottom of cap elevations shall be shown at cap ends and column junctions (face of column).

Column spacing shall be shown.

Foundation type and size shall be shown. If footings are used, the footing depth shall be shown.

The bent cap depth shall be shown. It is determined by design reinforcing requirements. Concrete bent caps are typically 3'-0" tall in cross section at a minimum. Pile bent caps are typically 2'-0" tall. Cap depths should be selected in 3" increments.

Reinforcement in the cap, columns, and footings or caissons shall be shown. Main reinforcement cutoffs in the top of the cap are detailed from the centerline of column. Main reinforcement cutoffs in the bottom are detailed from CL cap.

Spacing of stirrups must be detailed out fully (not at equal spacing or \pm). Spacing at ends of caps and at face of column can be either 2" or 3" in order to make numbers come out evenly.

Dimension strings for stirrup spacing shall have the following information:

Above the dimension line: spacing of reinforcing bars (i.e. 12 spaces at 5") (Do not use the @ symbol unless space does not allow "at")

Below the dimension line: Number and type bars: (i.e. 7-514 bars)

This method of detailing requires "gap" dimensions at changes in bar spacing and/or bar types

INSERT A PICTURE HERE SHOWING BEAM SPACING

Double stirrups can be accomplished by using overlapping stirrups of about 2/3 the width of the cap (6 - 521 DOUBLED) or by overlapping a regular full width stirrup with one in the center half of the cap (6 - 520 AND 521).

SECTION VIEWS

Section views shall be located to the upper right of the drawing.

Detail section views at twice the scale of the elevation view where possible.

Sectional views of the cap and column shall be shown. The column section must show clearance (3.625" by default, but is 2" if cap and column are not the same size).

The column section view shall be taken through the bar lap above the footing.

FOUNDATIONS

Different foundations require different details as follows:

For pile footings, a plan view of the pile layout shall be shown.

For drilled caissons, sectional views showing changes in cross section or reinforcing shall be shown.

NOTES

Locate notes to the right of drawing, above the title block.

PLAN DRIVING OBJECTIVE

Locate the Plan Driving Objective to the left of the notes.

QUANTITY TABLE

Locate a quantity table to the bottom and center of the drawing, but left of the Plan Driving Objective.

The description under ITEM shall be the same as the UNIT and PAY under the SUMMARY OF QUANTITIES on the General Notes Sheet.

All quantities shall be rounded as follows:

- Concrete – nearest tenth of a cubic yard
- Reinforcing Steel – nearest whole number

Use commas for thousands

Bent Table example

SUBSTRUCTURE QUANTITIES			
ITEM	BENT 2	BENT 3	BENT 4
CY CLASS AA CONCRETE	78.3	71.4	76.5
LB BAR REINF STEEL	18,532	16,458	17,938
LB STR STEEL, SWAYBRACING	109,253	99,523	106,721

TABLE OF ELEVATIONS

If a table of elevations is needed, locate table in lower middle of sheet above the sheet border.

Do not put elevations in a table for one bent.

33.4 CHECKLIST

See Section 40.20

34 MISCELLANEOUS SUBSTRUCTURE DETAILS

34.1 PURPOSE

Miscellaneous Substructure Details Drawing is used only if there isn't enough space on the End Bent or Intermediate Bent Drawings for the additional substructure details.

34.2 GENERAL GUIDANCE

If additional details are needed, the detail shall consist of all the outlines, dimensions, reinforcement and notes needed for construction. Place details in groups of similar details. (e.g. place Sections thru Cap either side by side or one above the other).

34.3 REQUIRED PRACTICES

Follow practices for End Bent and Intermediate Bent Detail Sheets

34.4 CHECKLIST

See End Bent and Intermediate Bent Checklists as applicable.

35 AS-BUILT FOUNDATION

35.1 PURPOSE

The purpose of this sheet is to provide a standard drawing for use by field personnel during the installation of the foundation elements to record the pile tip elevations achieved or the bottom of footing elevations constructed.

35.2 GENERAL GUIDANCE

Each set of bridge plans shall include an AS-BUILT FOUNDATION Sheet.

Piles in end bents and intermediate bents do not need pile numbers; they can be described by location (e.g. Left Wing, Beam 1, Beam 2, etc.)

35.3 REQUIRED PRACTICES

This sheet shall include tables for field personnel to record the elevations of the following items:

- pile tip
- bottom of seal
- bottom of footing elevation

Plan view sketches are required for Pile footings with piles identified by number. Piles in pile footings are numbered left to right, and then back to ahead. The numbering restarts with each footing.

Elevation View Sketches are required for spread footings and spread or pile footings with seals.

35.4 CHECKLIST

See Section 40.21

36 BAR REINFORCEMENT DETAILS

36.1 PURPOSE

This sheet is used to detail the dimensions and shapes of steel reinforcement bars used in bridges.

36.2 GENERAL GUIDANCE

Import the output from the BRRBAR program onto the rebar table provided in the BRCELL library.

There are three data tables in the BRCELL library preformatted to fit on a plan sheet (Cells Rebar1, Rebar2 and Rebar3). Only use Rebar3 if it saves using an additional sheet.

36.3 REQUIRED PRACTICES

Reinforcing Bars for bridges are detailed according to Georgia standard 3901 (8-69). Data and dimensions required to construct this reinforcement is presented in data tables corresponding to the output from the Georgia DOT BRRBAR computer program. This data and dimension are indicated on the rebar table of lettered dimensions on the Bar Reinforcing Details Sheet.

Bars are partitioned by structural units of spans and bents. Superstructure Spans are presented first, followed by substructure bents. When one section covers multiple units, use “or” instead of “and”, e.g. SPANS 1 OR 2 instead of SPANS 1 AND 2. “And” indicates that rebar for both spans is being detailed in one unit together.

36.3.1 REINFORCEMENT DETAIL PROGRAMS

1. Create an ASCII input file for the BRRBAR program using a text editor
 - a. Bar Types shall correspond to the bar types shown on GDOT Standard 3901. In the event that a bar type required is not provided on the standard, a unique bar type shall be detailed on the rebar sheet. (These are usually Type 60 and higher bars).
 - b. Bar Marks
 - i. Marks could be 3 or 4 numbers and may include a letter
 - ii. The first 1 number of 3 numbers or first 2 numbers of 4 numbers is the bar size (e.g. 504 is a #5 bar, 1102 is a #11 bar)
 - iii. The last 2 numbers are determine by location or sequence of construction and is called the series
 - iv. Letters shall be used in mark only if the bar is in the same location throughout the structure and the only difference is a dimension. (e.g. 401 is a barrier bar, 401A would be in span 1 or the first section of barrier in span 1, 402B would be in span 2 or the second section in span 1)

- v. Do not use unlettered bars and lettered bars within a mark (e.g. 406 and 406A, instead use 406A and 406B).
 - vi. Marks shall be in sequence
 - 1. First by bar size
 - 2. Second by last 2 numbers
 - 3. Third by the letter
 - vii. Avoid gaps in the series. However you will have gaps if you use the cells (no 402 or 406 bar) so until the cells are modified, it is acceptable to use the numbering in the cells and have gaps.
- c. Bar dimensions
- i. If the dimension does not include a fraction, leave fraction input blank. Do not use 0/0.
 - ii. If the dimension does not include inches, enter a 0 for inches. Do not use 00.
 - iii. If the dimension uses inches and the inches are 1 to 9, enter the single digit. Do not use 09.
 - iv. If the dimension is less than 1'-0", enter a 0 for feet. Do not leave the feet dimension blank and do not use 00 for the feet dimension.
 - v. Examples: 1- 0, 2- 9, 31- 1 1/8, 3- 0 3/4, 0- 8
- d. Insert a blank line after the last bar of the same size
- e. Insert 2 blank lines after the last bar of each unit
2. BRRBAR shall be used to calculate quantities and create the table file.

36.3.2 PLACE TABLE ON SHEET

1. Use BRRBAR to generate a bar table text file with the file name in lower case letters.
2. Create a BAR REINFORCEMENT DETAIL Sheet using Bridge Cells for a border (BORD) and 1st column grid (REBRF1) and second column (REBRF2).
3. Run the Microstation User Command to place English Rebar. In the user environment, this is a button with red text "E REB" on the Place Text toolbar.
4. First the user command asks for a file name. This file name must be all lower case and the entire path and file name must be less than 22 characters. Therefore you may have to place the file in a temporary folder. Enter the entire path and file name (e.g. c:\temp\barout.txt). Alternatively, you can leave this blank and press Enter (a dialog box will ask you to locate the file after you place the data point in the next step).

5. Second, the user command asks you to place the text at a data point. The rebar grid cells have a green point in the first row under Location that can be used to snap the text to the correct location (but it will all overrun off the bottom of the grid, so some people just place the text off to the side). Each line of the text file is brought in as a separate element and the data point is at the beginning of the first line. If this is not the case, there may be something wrong with the text file.
6. Move all of the text to fit into the columns using fence commands. It is easier to manipulate the lines of text if you do not drop cell status of the grids or border.
7. Some consultants use the Location column to indicate the location of individual bars in the bridge (e.g. the 521 bar may have "CAP STIRRUP"). This is not a GDOT requirement.

36.4 CHECKLIST

No check list is provided for this sheet.

37 WALL PLANS FOR CONTRACTOR DESIGNED WALLS

37.1 PURPOSE

Wall plan sheets shall provide sufficient information and details to allow the contractor to design and detail retaining walls.

These wall plans typically consist of Plan, Elevation, and Sectional details, General Notes, Design Data & Summary of Quantities for Mechanically Stabilized Embankment, (MSE) Walls or a Tie Back Walls.

37.2 GENERAL GUIDANCE

1. Use a vertical scale of 1" = 10 ft
 - a. The horizontal scale will be determined by the length of the wall, but preferably 1" = 10 ft
2. Detail dimensions to nearest 1/8" unless noted otherwise.
3. Detail Elevations to nearest .01 (hundredth) of a foot.
4. Coordinate with Roadway plans so that all wall designations are uniquely numbered and consistent.

37.3 REQUIRED PRACTICES

TITLE BLOCK

Place WALL NO. "X" over the Title Block

The following is an example of Wall Sheet Titles

PLAN AND ELEVATION - WALL No. 1	
I-75 WIDENING	
XXX COUNTY	PROJECT #

PLAN VIEW

The Plan View shall locate the wall with respect to the mainline or other construction reference line.

ELEVATION VIEW

The Elevation View should give the general profile of the top and bottom of the wall.

The bottom of the wall is normally 2 feet below finish grade unless noted otherwise.

The top and bottom limits of the wall should be defined by elevations of front and back face of the wall given at the following locations:

- wall begin and end
- major break points
- staging lines
- 50 ft intervals.

Additionally, elevations at the following points shall be shown:

- The maximum top of coping
- minimum bottom of wall

The elevation view is drawn with stationing shown from left to right which may force the elevation view to be looking at the back face of the retaining wall.

Because of the nature of stationing on wrap around abutments, always look at the front face of these walls.

SECTION VIEWS

Sections through the wall shall be provided to illustrate representative design conditions along the face of the wall.

Examples of Section through wall might include Sections at:

- end bents
- side barrier
- coping with concrete gutter

GEOMETRIC DATA

Plans should show Geometric data for the reference line, including Vertical and Horizontal Alignment, as well as Super Elevation Data.

If Wall serves as a vertical abutment for the end of a bridge, include the Geometric data for the Bridge Centerline.

GENERAL NOTES

1. Concrete finish, coatings and color requirements. Specify plain concrete finish by default.
2. Notes regarding shoring
3. Waiting period requirements, if applicable.
4. Note for backfill stabilizing Device added to the end bent (if a bridge is present).

DESIGN DATA

Provide applicable geotechnical information. A section addressing the required information is part of the selections in the BRNOTES program.

SUMMARY OF QUANTITIES

Provide all applicable pay items numbers, descriptions, and quantities. A typical selection of retaining wall quantities is included in the selections in the BRNOTES program.

37.4 CHECKLIST

A checklist for the detailer's convenience is provided at the end of this manual. See Section 40.22

38 ACCEPTED ABBREVIATIONS

38.1 PURPOSE:

The following abbreviations are accepted for use on GDOT bridge and retaining wall plans.

38.2 GENERAL GUIDANCE:

1. When writing out a note, avoid abbreviations entirely.
2. Abbreviations are generally to save room in a drawing, not to reduce typing

38.3 REQUIRED PRACTICES:

Pay Items have non-standard abbreviations that must match the Pay Item Index

38.3.1 LIST OF DEFINITIONS AND APPROVED ABBREVIATIONS

American Association of State Highway and Transportation Officials = AASHTO

Ahead	AH (e.g. BENT 3AH)
Alternate, alternating	ALT
Approximate	APPROX
American Society of Testing and Materials	ASTM
At	AT (not @)
average daily traffic	ADT
back	BK (e.g. BENT 4BK)
back face of pavement rest	BFPR
baseline	Use symbol
bearing	BRG
bent	BT
business	BUS (e.g. SR 52 BUS)
Centerline	use symbol
clearance	CL
concrete	CONC
construction	CONST
continued	CONT
cubic ft per second	CFS
cubic yard	CU YD
Department of Transportation	DOT (GDOT preferred)
Design Hourly Vehicles	DHV
diameter	DIA or Φ
diaphragm	DIAPH
double	DBL
each face	E.F.

each face	EA
eastbound lane	EBL
elevation	EL
equal	EQ
Expansion	EXP
feet	FT
Fixed	FIX
foot	FT
galvanized	GALV
Georgia	GA
grade	GR (e.g. A-709, GR 36)
horizontal	HORIZ
Identification number	I.D. NO.
inch	IN (e.g. 16 IN SQ PSC PILE)
joint	JT
left	LT
maximum	MAX
miles per hour	MPH
Minimum	MIN
northbound lane	NBL
Number	NO.
on center	O.C.
outer diameter	O.D.
plate	PL. or symbol
Point of Curvature	PC
Point of Intersection	PI
point of tangency	PT
pounds	LBS
pounds per square inch	PSI
Prestressed Concrete	PSC
profile grade line	PGL
Project ID (Identification) Number	P.I. NO.
point of vertical intersection	PVI
quarters	QTRS
radially measured	R
radius	R
reinforcement	REINF
required	REQ'D
Right	RT
southbound lanes	SBL
space, spaced	SP
spaces	SPS
square	SQ
Square Miles	SQ MI
Standard	STD
State Route	SR
Station	STA
Superelevation	S.E.
superstructure	SUPERSTR
Tangent	TAN
tangent of curve	TOC
top, middle, bottom	TMB
typical	TYP (usually with a comma, TYP)

Vertical Curve	V.C.
weight	WT
westbound lane	WBL
yards	YDS
year	YR

38.4 CHECKLIST

Not Applicable

39 DISCIPLINE SPECIFIC WORDS AND SYMBOLS

39.1 PURPOSE:

The following are the correct usage and spelling of words as used specifically for use on GDOT bridge and retaining wall plans.

39.2 GENERAL GUIDANCE:

39.3 REQUIRED PRACTICES:

39.3.1 LIST OF DISCIPLINE SPECIFIC WORDS

Edge beam
End post
Endwall
floodstage
groundline
Highwater
Rip rap
Sub-section
Wingwall

39.3.2 LIST OF DISCIPLINE SPECIFIC SYMBOLS

^d as in 10^d for 10 penny nail

39.4 CHECKLIST

Not Applicable

40 DESIGN CHECKLISTS

The following Design Checklists are provided to assist the detailer in making sure the plans contain the required information. The checklist is provided for the users benefit and is by no means considered all inclusive or to relieve the designer of any responsibility in the preparation of plans.

40.1 PRELIMINARY PLANS – PRELIMINARY LAYOUT CHECKLIST

See Section 4

40.1.1 PLAN VIEW

LINEWORK

Transverse Lines

- ☐ BFPR
- ☐ Centerline Bent
- ☐ Front Face of Wall

Longitudinal Lines

- ☐ Reference line (may be Construction Centerline, Centerline Roadway, and/or Centerline bridge)
- ☐ Outside edges of bridge
- ☐ Inside and outside edges of barrier, parapet, sidewalk and raised median
- ☐ Construction Joints and/or Expansion Joints
- ☐ CL Utilities

Outlines

- ☐ Wingwalls (show pile boxes if present)
- ☐ End posts
- ☐ Existing bridge including centerline of bents

LABELS

- ☐ Begin and end bridge stations
- ☐ Equality Stations
- ☐ Limits of Existing Bridge
- ☐ Angles of intersection at reference line and BFPR and CL Bents
- ☐ Bent numbers
- ☐ BRIDGE TO BE REMOVED
- ☐ Limits of each Stage of construction
- ☐ North arrow
- ☐ Roadway destinations with arrows
- ☐ Profile Grade Line = CL Construction = CL Bridge, etc.
- ☐ Bearing, PC Station and PT Station
- ☐ Existing and proposed utilities from Centerline bridge
- ☐ Temporary Shoring, as necessary
- ☐ Culverts or utilities not on the bridge but that would have an effect on the method of construction
- ☐ Temporary Barrier
- ☐ Utilities

DIMENSIONS

- ☐ Out to Out
- ☐ Gutter to Gutter

- ☐ Gutter to edge of deck
- ☐ Inside face of parapet/barrier to edge of deck
- ☐ Gutter to reference line
- ☐ Sidewalk
- ☐ Raised median
- ☐ Edge of raised median to reference line
- ☐ Stage Construction widths

CASE-SPECIFIC ITEMS

Grade Separation – Roadway

- ☐ Width of roadway
- ☐ Ahead arrow
- ☐ Roadway destinations with arrows
- ☐ Profile Grade Line
- ☐ Bearing, PC Station and PT Station
- ☐ Station and angle at the intersection of the bridge reference line and intersecting roadway
- ☐ Minimum horizontal clearance from edges of roadway to the face of the bents
- ☐ Point of minimum vertical clearance
- ☐ Limits of slope paving

Grade Separation – Railroad

- ☐ Centerline
- ☐ Ahead arrow
- ☐ Railroad destinations with arrows
- ☐ Bearing, PC Station and PT Station
- ☐ Station, angle and distance to nearest Milepost (with Milepost No.) at the intersection of the bridge and railroad
- ☐ Minimum horizontal clearance @ CL tracks to the face of the bents
- ☐ Point of minimum vertical clearance
- ☐ Limits of slope paving

Stream Crossing

- ☐ Flow direction, ebb or flood tide directions
- ☐ Approximate edge of bank lines at normal flow
- ☐ Limits of Riprap

40.1.2 ELEVATION VIEW

LINEWORK

Vertical Lines

- ☐ BFPR and Centerline bent
- ☐ Front face of Walls

Horizontal Lines

- ☐ Top of Fence (can be partial length) (optional)
- ☐ Top of Barrier or parapet
- ☐ Top of Deck
- ☐ Bottom of Deck
- ☐ Bottom of Beam

Outlines

- ☐ Wingwalls (show pile boxes if present)
- ☐ End posts
- ☐ Architectural rail details (Texas and Kansas; may be detailed partially)
- ☐ Intermediate bents
- ☐ Caps
- ☐ Column or Pile above ground line

LABELS

- ☐ Vertical line above BFPR and CL Bents with station above line and elevation below (stations match plan view)
- ☐ Bent numbers in circle below each BFPR or bent
- ☐ Approximate original, (the natural ground line), proposed and future ground lines
- ☐ Hatch existing fill to be removed and note – EXISTING FILL TO BE REMOVED. SEE ROADWAY PLANS FOR PAYMENT.
- ☐ 2:1 end slope with *
- ☐ Elevation marks along each end of elevation view starting 20 feet below the ground line and ending above the highest point of the bridge using 5 foot increments
- ☐ Station marks beneath elevation view starting 50 feet before the beginning wingwall and ending 50 feet after the ending wingwall using 50 foot increments (Stations detailed on 100 foot increments)

DIMENSIONS:

- ☐ Total length of bridge measured along reference line
- ☐ Length of each span measured along reference line

CASE-SPECIFIC ITEMS

Grade Separation – Roadway

- ☐ Paved limits (travel lanes; include shoulder line if it controls)
- ☐ Minimum Vertical clearance

Grade Separation – Railroad

- ☐ CL of track
- ☐ Railroad rails and tie (exaggerated to show detail)
- ☐ Show railroad fill and ditches
- ☐ Minimum Vertical clearance (also include actual for CSX)

Stream Crossing

- ☐ Flood stage elevations at design flood, 100, and 500 years (stops at Rip-Rap)
- ☐ Abnormal flood elevations
- ☐ High and tide elevations
- ☐ Approximate 500 year scour line
- ☐ Horizontal and vertical clearances for navigable waterways

40.1.3 DETAILS

Place details in groups of similar details.

(e.g. place Vertical curve data and Horizontal curve data either side by side or one above the other)

- ☐ Vertical curve data
- ☐ Horizontal curve data
- ☐ Superelevation transition data
- ☐ Benchmark data
- ☐ Traffic Data
- ☐ Drainage Data
- ☐ Utilities
- ☐ Berm Elevations table
- ☐ Existing bridge elevations table
- ☐ Theoretical Scour Data
- ☐ Existing bridge serial no., Existing bridge ID No., Project PI No.
- ☐ Consultant PE stamp, signed, and dated

BRIDGE CONSISTS OF

- ☐ Number of spans, Span lengths and types of beams
- ☐ Type of end bents
- ☐ Type of intermediate bents
- ☐ Size and Type of Riprap
- ☐ Width and length of Detour Bridge
- ☐ Decorative Barrier or Parapet, Special Design

Grade Separation – Roadway

- ☐ Slope paving detail with Section X-X

Grade Separation – Railroad

- ☐ Slope paving detail
- ☐ RR section with end roll and side ditch detail
- ☐ Construction Clearance Diagram
- ☐ Track Curve Data
- ☐ Track Profile Data

Stream Crossing

- ☐ Riprap detail
- ☐ Hydraulic and scour data table

40.1.4 NOTES

- ☐ All bents parallel (to some bent if a grade separation or on curve) (if applicable)
- ☐ End bent piles not shown
- ☐ *Slope normal to end bent
- ☐ **Stations and Elevations are at intersection of profile grade line and BFPR or centerline bent
- ☐ Bridge crown or superelevation data
- ☐ Minimum allowable bottom of beam for RCDG
- ☐ Detour Bridge length, length and minimum beam elevation

40.2 PRELIMINARY PLANS – CONSTRUCTION SEQUENCE CHECKLIST

See Section 5

Each deck section should include the following:

LINE WORK:

- ☐ Existing bridge
- ☐ Temporary barrier, barrier, parapet, sidewalk and raised median
- ☐ Slab
- ☐ Beams and coping
- ☐ Median, sidewalk

Details

- ☐ Reference Line
- ☐ Utilities
- ☐ Traffic direction arrows

LABELS:

- ☐ Label each section by Stage
- ☐ Reference line
- ☐ Temporary Barrier
- ☐ Construction Joints
- ☐ Existing and proposed beams
- ☐ Utilities

DIMENSIONS:

- ☐ from Reference Line to construction joint or cutlines
- ☐ Distance to Temporary Barrier from edge of deck
- ☐ from Cut lines and Construction joints
- ☐ Distance to and width of traffic lanes
- ☐ Width of stage
- ☐ Overhang dimension
- ☐ Beam spacing
- ☐ Utilities by stage
- ☐ Hatched sections that are to be removed

NOTES:

- ☐ Narrative description of the construction sequence in a numbered list
- ☐ COORDINATE THE AFOREMENTIONED SEQUENCE WITH ROADWAY OPERATIONS, SEE ROADWAY PLANS.
- ☐ IN LIEU OF THE ABOVE CONSTRUCTION SEQUENCE, THE CONTRACTOR MAY SUBMIT A PROPOSED CONSTRUCTION SEQUENCE FOR APPROVAL BY THE ENGINEER.

40.3 PRELIMINARY WALL PLANS CHECKLIST

See Section 6

Plan View

- ☐ Begin and end wall station and offset
- ☐ Station and offset at each bend in wall or change in taper or curvature
- ☐ Show reference line that wall parallels and distance if it is constant
- ☐ Show station tickmarks along reference line
- ☐ Show staging line
- ☐ Show roadway vertical curve info that affects wall envelope (top or bottom)
- ☐ North arrow

Elevation View

- ☐ Begin and end wall station and elevation (top and bottom)
- ☐ Top of leveling pad (2' below groundline or bottom of ditch)
- ☐ Proposed ground line
- ☐ Stations and elevations at all wall vertexes and staging lines
- ☐ Dimension actual lengths of each wall segment and overall length of wall
- ☐ Staging line (joint)
- ☐ Top of coping (labeled), bottom of coping (not labeled, 1' below top of coping)
- ☐ Top of wall (labeled)
- ☐ If abutment wall, show end bent with begin bridge station

Section Views

- ☐ Show sections for each unique situation (under bridge, with ditch, without ditch, different types of coping, etc.)

Other

- ☐ Curve data
- ☐ Expansion and contraction joints
- ☐ Approximate original ground line
- ☐ Horizontal and Vertical Scales

40.4 PLAN AND ELEVATION CHECKLIST

See Section 8

40.4.1 NOTES

- ☐ All bents are parallel (to some bent for grade separations or curved bridges) (if applicable)
- ☐ Angles are measured to the tangent of the CL Construction at intersection with the BFPR or CL Bent
- ☐ End bent piles not shown
- ☐ * Slope normal to end bent
- ☐ ** Stations and elevations are along profile grade line at the intersection of profile grade line and BFPR or CL bents
- ☐ Superelevation data

40.4.2 DETAILS

- ☐ Vertical Curve Data
- ☐ Horizontal Curve
- ☐ Superelevation transition data
- ☐ Existing bridge serial no., Existing bridge ID No., Project PI No.
- ☐ Consultant PE stamp, signed, and dated

Grade Separation – Roadway

- ☐ Slope paving detail with Section X-X

Grade Separation – Railroad

- ☐ Slope paving detail
- ☐ RR section with end roll and side ditch detail
- ☐ Railroad control diagram
- ☐ Construction Clearance Diagram
- ☐ Track Curve Data
- ☐ Track Profile Data

Stream Crossing

- ☐ Riprap detail

40.4.3 PLAN VIEW

LINEWORK

Transverse Lines

- ☐ Paving Rest
- ☐ BFPR
- ☐ Centerline Intermediate Bent
- ☐ Front Face of Wall
- ☐ Joints in barrier (scale permitting)

Longitudinal Lines

- ☐ Reference line (may be Construction Centerline, Centerline Roadway, and/or Centerline bridge)
- ☐ Outside edges of bridge
- ☐ Inside and outside edges of barrier, parapet, sidewalk and raised median
- ☐ Construction Joints

Outlines

- ☐ Wingwalls
- ☐ Pile boxes
- ☐ End posts
- ☐ Existing bridge including centerline of bents

LABELS

- ☐ Begin and end bridge stations
- ☐ Angles of intersection at reference line and BFPR and CL Bents
- ☐ Bent numbers
- ☐ LIMITS OF EXISTING BRIDGE (TO BE REMOVED)
- ☐ North arrow
- ☐ Roadway destinations with arrows
- ☐ Profile Grade Line = CL Construction = CL Bridge, etc.
- ☐ Bearing, PC Station and PT Station (if scale permits)
- ☐ Existing and proposed utilities from Centerline bridge
- ☐ Temporary Shoring, as necessary
- ☐ Culverts or utilities not on the bridge but that would have an effect on the method of construction

DIMENSIONS

- ☐ Gutter to Gutter
- ☐ Gutter to edge of deck
- ☐ Inside face of parapet to edge of deck
- ☐ Gutter to reference line
- ☐ Sidewalk
- ☐ Raised median
- ☐ Edge of raised median to reference line
- ☐ Stage Construction widths (or flagged)

CASE-SPECIFIC ITEMS

Grade Separation – Roadway

- ☐ Width of roadway
- ☐ Ahead arrow
- ☐ Roadway destinations with arrows
- ☐ Profile Grade Line
- ☐ Bearing, PC Station and PT Station
- ☐ Station and angle at the intersection of the bridge reference line and intersecting roadway
- ☐ Minimum horizontal clearance from edges of roadway to the face of the bents

- ☐ Point of minimum vertical clearance
- ☐ Limits of slope paving

Grade Separation – Railroad

- ☐ Centerline
- ☐ Ahead arrow
- ☐ Railroad destinations with arrows
- ☐ Bearing, PC Station and PT Station (if scale permits)
- ☐ Station, angle and distance to nearest Milepost (with Milepost No.) at the intersection of the bridge and railroad
- ☐ Minimum horizontal clearance from CL tracks to the face of the bents
- ☐ Point of minimum vertical clearance
- ☐ Limits of slope paving

Stream Crossing

- ☐ Flow direction, ebb or flood tide directions
- ☐ Approximate edge of bank lines at normal flow
- ☐ Limits of Riprap, typ. on one corner

40.4.4 ELEVATION VIEW

LINEWORK

Vertical Lines

- ☐ BFPR and Centerline bent
- ☐ Front face of Walls
- ☐ Joints in barrier

Horizontal Lines

- ☐ Top of Fence (can be partial length)
- ☐ Top of Barrier or parapet
- ☐ Top of Deck
- ☐ Bottom of Deck
- ☐ Bottom of Beam

Outlines

- ☐ Wingwalls
- ☐ Pile boxes
- ☐ End posts
- ☐ Architectural rail details (Texas and Kansas; may be detailed partially)
- ☐ Intermediate bents
- ☐ Caps
- ☐ Column, footing, piles for intermediate bents
- ☐ Pile bents to below groundline

LABELS

- ☐ Vertical line above BFPR and CL Bents with station above line and elevation below
- ☐ EXP or FIX labels at ends of beams
- ☐ Bent numbers in circle below each BFPR or bent
- ☐ Approximate original, (the natural groundline), proposed and future ground lines
- ☐ Hatch existing fill to be removed and note – EXISTING FILL TO BE REMOVED. SEE ROADWAY PLANS FOR PAYMENT.

- ☐ 2:1 end slope with * Bent Footing Elevations for Spread Footings (e.g. 209.0±)
- ☐ Piles under Pile Footings (do not show piles hidden in the footing) and elevation (e.g. 381.00)
- ☐ Seal concrete (with bottom elevation, e.g. 201.0±)
- ☐ Caissons with tip elevation (e.g. 212.0±) and top of caisson elevation (e.g. 202.0)

DIMENSIONS:

- ☐ Total length of bridge measured along reference line
- ☐ Length of each span measured along reference line
- ☐ Length of each continuous unit

CASE-SPECIFIC ITEMS

Grade Separation – Roadway

- ☐ Paved limits (travel lanes; include shoulder line if it controls)
- ☐ Minimum Vertical clearance

Grade Separation – Railroad

- ☐ Railroad rails and tie (exaggerated to show detail)
- ☐ Show railroad fill and ditches
- ☐ Minimum Vertical clearance (also include actual for CSX)
- ☐ Centerline of Track

Stream Crossing

- ☐ Flood stage elevations at design flood, 100, and 500 years (stops at Rip-Rap)
- ☐ Abnormal flood elevations
- ☐ High and low tide elevations
- ☐ Horizontal and vertical clearances for navigable waterways

Details that should be **REMOVED** from the PRELIMINARY LAYOUT to create the PLAN & ELEVATION are:

On the Elevation View – Remove the following:

Details

- ☐ Elevation marks along each end of elevation view
- ☐ Station marks beneath elevation view

For Stream Crossings

- ☐ Approximate 500 year scour line

Remove the following Miscellaneous Details

- ☐ Benchmark data
- ☐ Traffic Data
- ☐ Drainage Data
- ☐ Utilities Data
- ☐ Berm Elevations table
- ☐ Existing bridge elevations table
- ☐ Theoretical scour data

Remove the following Notes

- ☐ Bridge crown or superelevation data
- ☐ Minimum allowable bottom of beam for RCDG
- ☐ Detour Bridge length, length and minimum beam elevation
- ☐ BRIDGE CONSISTS OF

40.5 SPECIAL DESIGN PARAPET DETAILS CHECKLIST

See Section 11

NOTES:

LABELS:

DIMENSIONS:

DETAILS:

REINFORCEMENT:

40.6 DECK DRAINAGE SYSTEM DETAILS CHECKLIST

See Section 12

NOTES:

LABELS:

DIMENSIONS:

DETAILS:

REINFORCEMENT:

40.7 CONCRETE SUPERSTRUCTURE: DECK PLAN CHECKLIST

See Section 14

LINE WORK:

Outlines

- ☐ Wingwalls
- ☐ Pile boxes
- ☐ End posts
- ☐ Top flange of beams (bulb-tees are also shaded)

LABELS:

- ☐ Reference Line ID
- ☐ Span ID
- ☐ Beam ID
- ☐ CL Bent ID
- ☐ BFPR ID
- ☐ Begin Bridge, STA. XX+XX.XX
- ☐ End Bridge, STA XX+XX.XX
- ☐ Expansion Joints in Barrier/Parapet

DIMENSIONS:

- ☐ Paving rest width
- ☐ Endwall interior
- ☐ Endwall exterior
- ☐ Diaphragm
- ☐ Edge beam
- ☐ Barrier, parapet, sidewalk and raised median
- ☐ Joint spacing in barrier or parapet (no joints in sidewalk or median unless there is a joint in deck)
- ☐ Length of endpost
- ☐ Fence post spacing
- ☐ Gutter to gutter
- ☐ Location of longitudinal construction joints (staged construction)
- ☐ Location of diaphragms (if not on Beam Layout or PSC beam sheet)
- ☐ Backwall
- ☐ Light post spacing

NOTES:

- ☐ MAINTAIN 2" CLEARANCE ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.
- ☐ MINIMUM LENGTH OF LAP SPLICES
- ☐ Additional Waterproofing note

DETAILS:

- ☐ Joint details

- ☐ Chart of T1 & T2 for T beam spans
- ☐ Barrier/Parapet details (502 at every other 500 or 12" max)
- ☐ Barrier Transition Details
- ☐ Expansion Joint in Barrier Detail
- ☐ Median details
- ☐ Deck Drain details
- ☐ Skewed Corner Detail (if skew of 75 degrees or less)
- ☐ Bar Bending detail at Skewed Joint (if applicable)
- ☐ Superstructure Quantities Table
 - ☐ END POST CONCRETE AND BAR REINFORCEMENT STEEL INCLUDED IN END SPANS.
 - ☐ 600 BARS INCLUDED IN SPAN X

REINFORCEMENT:

Longitudinal Reinforcement

- ☐ Deck (sample showing laps, 400)
- ☐ 600 bars with length
- ☐ Barrier or parapet (callout bar number only, do not show bar, 401x)
- ☐ Raised Median (callout only if different from longitudinal deck reinforcement, 400x)

Transverse bars

- ☐ Varying Bars in Sidewalk or median (or in separate detail) if not constant width

40.8 CONCRETE SUPERSTRUCTURE: DECK SECTIONS CHECKLIST

See Section 15

Misc deck section DETAILS:

- ☐ Crown detail
- ☐ Joint details
- ☐ Sections through sidewalk and median

40.8.1 PARTIAL SECTION THRU SLAB

Section shall be located in the top left corner of the drawing.

NOTES:

- ☐ DIMENSION “D” IS MEASURED FROM TOP OF SLAB TO TOP OF BEAMS AT CENTERLINE BEARING. VARY “D” BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTION AND VERTICAL CURVE (if any). MAINTAIN A CONSTANT SLAB THICKNESS OF X”.
- ☐ Minimum length of lap splices
- ☐ Maintain 2” clearance on all reinforcement unless otherwise noted.
- ☐ Placement of 400 and 500 bars in curved bridges

LABELS:

- ☐ Beam ID
- ☐ Reference line ID
- ☐ Cross slope
- ☐ Sidewalk Slope
- ☐ Utilities
- ☐ PGL (can be shown in crown detail)
- ☐ Sidewalk and raised median cross slope

DIMENSIONS:

- ☐ Slab thickness
- ☐ Overhang thickness
- ☐ Slab Cover (Top & Bottom)
- ☐ Overhang width
- ☐ Beam spacing
- ☐ “D” dimension
- ☐ Gutter to Gutter
- ☐ Width to Stages (Staged Construction)
- ☐ Gutter line to reference line
- ☐ Reference line to cut line, construction joint, pour strip

- ☐ Widths of Barrier, parapet, sidewalk, raised median, pour strips
- ☐ Outside edge of slab to outside face of barrier and parapet
- ☐ Parapet height above sidewalk
- ☐ Sidewalk thickness
- ☐ Lap splices

REINFORCEMENT:

Transverse slab reinforcement bars:

- ☐ Slab top bar – Bar number and Spacing (500)
- ☐ Slab bottom bar – Bar number “UNDER EVERY” Bar number for top transverse bar (501)
- ☐ Additional Overhang reinforcement bar (if required)

Longitudinal slab reinforcement bars:

- ☐ top temperature – filled circle (400)
- ☐ top continuity – open circle (600)

Bottom Distribution Steel:

- ☐ Number of bottom distribution slab reinforcement bars (mid-half and outer quarters)
- ☐ Spacing to first bar in outer quarter
- ☐ Location and number of bars shown in overhangs

40.8.2 PARTIAL SECTION THRU DIAPHRAGM - PSC BEAMS

Partial Section thru Diaphragm shall be attached to the right side of Partial Section thru Slab.

LABELS:

- ☐ Reference Line ID
- ☐ Cross Slope
- ☐ Slope on Sidewalks & Raised Medians
- ☐ Utilities
- ☐ REQUIRED CONSTRUCTION JOINT PARALLEL WITH DECK under barrier
- ☐ Omit Diaphragm (if applicable)
- ☐ Beam ID
- ☐ CL ¾" TRIANGULAR DRIP BEAD FULL LENGTH OF BRIDGE
- ☐ PGL

DIMENSIONS:

- ☐ Beam spacing
- ☐ Overhang
- ☐ Edge of deck to CL drip bead (3")
- ☐ Parapet
- ☐ Front of barrier to edge of deck

DETAILS:

- ☐ Show Opening size and location of utilities

REINFORCEMENT:

- ☐ Show reinforcement around utility openings. Bars are in each face.
- ☐ Bars in top of diaphragm (509)
- ☐ Bars in middle of diaphragm (407)
- ☐ Bars in bottom of diaphragm (509)
- ☐ Stirrups with location and number (408)
- ☐ Edge of top flange to first stirrup
- ☐ Stirrups under flange of bulb tees (408x)
- ☐ Plain bar (overlapping in web if diaphragms staggered)

40.8.3 PARTIAL SECTION THRU ENDWALL

If possible, Partial Section thru Endwall shall be aligned directly below Partial Section thru Slab.

NOTES:

- ☐ BARS 4xx, 5xx, NOT SHOWN (endwall stirrups (506B), fillet bars (506A), paving rest stirrup (504), back face bar (404) and paving rest bar (505))

LABELS:

- ☐ Reference line ID
- ☐ Cross slope
- ☐ Slope on Sidewalk & Median
- ☐ Construction Joints
- ☐ Utilities
- ☐ ½" PREFORMED JOINT FILLER between wingwall and endwall
- ☐ ½" PREFORMED JOINT FILLER between bottom of endwall and end bent cap
- ☐ 1" PREFORMED FOAM JOINT FILLER AROUND PAD, TYP.
- ☐ ¾" CHAMFER in bottom corner, two sides

DIMENSIONS:

- ☐ End post height
- ☐ End post width
- ☐ inside face of wingwall to outside face of end post
- ☐ inside face of end post to reference line

DETAILS:

- ☐ Opening size and Location of Utilities

REINFORCEMENT:

- ☐ 900 bars
- ☐ Bars around utility openings

40.8.4 PARTIAL SECTION THRU EDGE BEAM

Partial Section thru Edge Beam shall be attached to the right side of Partial Section thru Endwall.

NOTES:

- ☐ BARS 405 (edge beam stirrups) ARE PLACED PARALLEL TO BEAMS

LABELS:

- ☐ Reference Line ID
- ☐ Cross Slope
- ☐ Slope on Sidewalks & Raised Medians
- ☐ Utilities
- ☐ POUR EDGE BEAM FLUSH WITH OUTSIDE OF BEAM

DIMENSIONS:

None

REINFORCEMENT:

- ☐ Bars in top of edge beam (800)
- ☐ Continuous bar in bottom of edge beam (801)
- ☐ Bar in bottom of edge beam (802)
- ☐ Continuous bars in middle of edge beam (507)
- ☐ Bars in middle of edge beam (508)
- ☐ Edge beam stirrups and dimensions for placement (405)
- ☐ Edge beam stirrups under flange of bulb tee (405)
- ☐ Additional bars in front of exterior beam (403 or 409)

40.9 CONCRETE SUPERSTRUCTURE: BEAM LAYOUT CHECKLIST

See Section 17

LINE WORK:

Longitudinal lines:

- ☐ Centerline Beam
- ☐ Reference Line

Transverse lines:

- ☐ BFPR
- ☐ CL Bent
- ☐ Diaphragms

NOTES:

- ☐ Description of the beam layout

LABELS:

- ☐ BFPR
- ☐ Centerline Beam
- ☐ Reference Line
- ☐ Centerline Bent
- ☐ Centerline Diaphragm or cross frame

Angles of intersection between:

- ☐ BFPR and Centerline Beam
- ☐ Centerline Bent and Centerline Beam
- ☐ Centerline Beam and Diaphragm

DIMENSIONS (shown in feet to two decimal places):

Along BFPR and Centerline of bents:

- ☐ Between beams
- ☐ Between beams and Reference Line

Along centerline of beams:

- ☐ Between BFPR and Diaphragm
- ☐ Between Diaphragm and centerline of bent
- ☐ Between centerline of bent and Diaphragm
- ☐ Between Diaphragm and BFPR

40.10 CONCRETE SUPERSTRUCTURE: PSC BEAM DETAILS CHECKLIST

See Section 18

Modify the basic drawings as follows:

NOTES:

- ☐ # and size of strands (e.g. "34 - 1/2" DIAMETER SPECIAL LOW-RELAXATION STRANDS")
- ☐ Strand diameter given in notes matches strand diameter given under beam sections
- ☐ Number of strands given in notes matches number in beam sections
- ☐ Pretension force per strand (Ultimate Strength x Area of Strand x Multiplier for allowable jacking force, value to nearest pound) (1/2" special area = 0.167, 33,818 lbs; 0.6" area = 0.217, 43,943 lbs)
- ☐ Total jacking force for the beam (Force per strand to nearest pound x Number of Strands)
- ☐ Prestressing force for the beam after losses (From the design calculations, value to nearest pound)
- ☐ Concrete release strength
- ☐ Nominal (28 day) concrete strength
- ☐ Allowable tension in concrete

LABELS:

- ☐ Modify labels as appropriate in elevation view for "BFPR OR CL BENT", "BFPR", or "CL BENT"
- ☐ Deflection Data non-composite (Δ_{NC}) and composite (Δ_C) in inches.
- ☐ Draped strands
- ☐ CL low friction type hold down (omit if no drape)

DIMENSIONS:

Detail or tabulate:

- ☐ Span length
- ☐ Beam length
- ☐ Centerline bearing to centerline bearing
- ☐ Centerline bent or BFPR to end of beam
- ☐ End beam to centerline bearing
- ☐ Centerline bent to centerline bearing
- ☐ Dimension to diaphragm bar holes (from beam midpoint and from top of beam)
- ☐ Dimension to draped strand hold down point (if hold down is not at midpoint of beam)
- ☐ Dimension to top of drape in section view at beam end

DETAILS:

- ☐ Add recess Detail for Diaphragm End Bars
- ☐ Add Bevel Detail (top flange beveling) (if applicable) w/ appropriate skew
- ☐ Show strand locations – Sections at Midpoint and End
- ☐ If strands are not draped, do not conflict with bearing chase

REINFORCEMENT:

Possible modifications include:

- ☐ Shear reinforcement – detail spacing and location
- ☐ Update shear reinforcement bar size near end of beam if needed (4 locations: Elevation, Section at End, Reinforcement details, Reinforcement notes)
- ☐ Check that strands in elevation view (draped and straight) match what is shown at end of beam
- ☐ Callout for number of raised strands in elevation matches number shown for end of beam

40.11 CONCRETE SUPERSTRUCTURE: NEOPRENE PAD DETAILS

See Section 19

Modify basic drawing, starting with appropriate sheet for

- pad without beveled shim plates,
- pad with beveled shim plates, or
- pad under T-beam (no sealing rib)

DETAILS

- ☐ Choose correct direction of skew for Plan at end bent
- ☐ Section at endwall should show beveled shim plate as necessary
- ☐ Do not modify number of internal plates shown in section view
- ☐ Delete beveled shim plate sections that do not apply
- ☐ Add unreinforced pad if needed
- ☐ Design Shear Deflection to hundredths of an inch
- ☐ Bearing pad thickness to eighth of inch
- ☐ Shim plate thicknesses to nearest eighth of inch
- ☐ Design loads to nearest kip
- ☐ If length of pad > 10" make sure XDIST on PSC beam sheet is > 7"

NOTES

Modify BEARING PADS HAVE BEEN DESIGNED note to call out only the pads with plates if using unreinforced pads

40.12 STEEL SUPERSTRUCTURE: DECK PLAN CHECKLIST

See Section 21

LINE WORK:

Transverse Lines

- ☐ Front Face of backwall
- ☐ BFPR
- ☐ Fillet at endwall
- ☐ Edge beam
- ☐ Centerline Bent
- ☐ Centerline Expansion and Dummy joints in deck, barrier, parapet, sidewalk and raised median
- ☐ Backwall

Longitudinal Lines

- ☐ Reference Line
- ☐ Outside edges of bridge
- ☐ Longitudinal construction joints (Staged Construction)
- ☐ Inside and outside edges of barrier, parapet, sidewalk and raised median
- ☐ Centerline Beams
- ☐ Top flange of beams
- ☐ Outlines
- ☐ Wingwalls
- ☐ Pile boxes
- ☐ End posts

LABELS:

- ☐ Reference Line ID
- ☐ Span ID
- ☐ Beam ID
- ☐ CL Bent ID
- ☐ BFPR ID
- ☐ Begin Bridge, STA. XX+XX.XX
- ☐ End Bridge, STA XX+XX.XX
- ☐ Angles of Intersection (Bents, Reference Line)
- ☐ Longitudinal bar labels

DIMENSIONS:

- ☐ Paving rest
- ☐ Endwall
 - ☐ Interior
 - ☐ Exterior
- ☐ Backwall
- ☐ Fillet

- ☐ Edge beam
- ☐ barrier, parapet, sidewalk and raised median
- ☐ joint spacing in barrier, parapet, sidewalk, raised median, and light post
- ☐ Length of end post
- ☐ Fence post spacing
- ☐ Gutter to gutter
- ☐ Location of Longitudinal Construction Joints (Staged Construction)
- ☐ Out to Out
- ☐ Location of Diaphragms
- ☐ Length of 600 bar (Typically a dimension to one end of the bar from a CL bent)
- ☐ Length of lap splices

NOTES:

- ☐ MAINTAIN 2" CLEARANCE ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.
- ☐ END POST CONCRETE AND BAR REINFORCEMENT STEEL INCLUDED IN END SPANS.
- ☐ 600 BARS INCLUDED IN SPAN X
- ☐ MINIMUM LENGTH OF LAP SPLICES

DETAILS:

- ☐ Superstructure Quantities Table
- ☐ Sections thru endwall and edge beam (if scale permits)
- ☐ Joint details
- ☐ Barrier/Parapet details
- ☐ Barrier Transition Details
- ☐ Expansion Joint in Barrier Detail
- ☐ Median details
- ☐ Deck Drain details
- ☐ Skewed Corner Detail (if applicable)
- ☐ Bar Bending detail at Skewed Joint (if applicable)

REINFORCEMENT

- ☐ Longitudinal Reinforcement
 - ☐ Deck
 - ☐ Sidewalk
 - ☐ Raised Median
 - ☐ 600 bars
- ☐ Transverse bars
 - ☐ Varying Bars in Sidewalk or median
- ☐ Skewed Corner Detail (if applicable)
- ☐ Bar Bending detail at Skewed Joint (if applicable)

40.13 STEEL SUPERSTRUCTURE: DECK SECTIONS CHECKLIST

See Section 23

40.13.1 PARTIAL SECTION THRU SLAB

Section shall be located in the top left corner of the drawing.

NOTES:

- ☐ "D" Dimension Note
- ☐ Note regarding any required temporary bracing.
- ☐ Minimum length of lap splices

LABELS:

- ☐ CL 3/4" TRIANGULAR DRIP BEAD FULL LENGTH OF BRIDGE
- ☐ Beam ID
- ☐ Reference line ID
- ☐ Cross slope
- ☐ Sidewalk slope

DIMENSIONS:

- ☐ Slab thickness
- ☐ Overhang thickness
- ☐ Slab Cover (Top & Bottom)
- ☐ Overhang width
- ☐ Beam spacing
- ☐ "D" dimension
- ☐ Gutter to Gutter
- ☐ Width to Stages (Staged Construction)
- ☐ Gutter line to reference line
- ☐ Reference line to cut line, construction joint, pour strip
- ☐ Widths of Barrier, parapet, sidewalk, raised median, pour strips
- ☐ Outside edge of slab to outside face of barrier and parapet
- ☐ Outside edge of slab to drip bead
- ☐ Parapet above sidewalk
- ☐ Sidewalk thickness

DETAILS:

- ☐ Barriers/Parapets
- ☐ Sidewalks
- ☐ Medians
- ☐ Joints
- ☐ Fences
- ☐ Utilities/Hangers
- ☐ Crown Detail

REINFORCEMENT:

- ☐ Transverse slab reinforcement bars (Top & Bottom)
 - ☐ top bar – Bar number and Spacing
 - ☐ bottom bar – Bar number “UNDER EACH” Bar number for top transverse bar
- ☐ Additional Overhang reinforcement bar (if required)
- ☐ Longitudinal slab reinforcement bars
 - ☐ top temperature – filled circle
 - ☐ top continuity – open circle
 - ☐ bottom distribution – filled circle
- ☐ Bottom Distribution Steel
 - ☐ Number of bottom distribution slab reinforcement bars (in mid-half and outer quarters)
 - ☐ Spacing to first bar in outer quarter

40.13.2 PARTIAL SECTION THRU CROSS FRAMES PARTIAL SECTION THRU CROSS
FRAMES SHALL BE ATTACHED TO THE RIGHT SIDE OF PARTIAL SECTION THRU SLAB.

- ☐ Provide notes, labels etc as for the Section through the slab
- ☐ Show and dimension all utility conduits

40.13.3 PARTIAL SECTION THRU EDGE BEAM

Partial Section thru Edge Beam shall be attached to the right side of Partial Section thru Endwall.

NOTES:

- ☐ BEARING ASSEMBLES NOT SHOWN
- ☐ MAINTAIN 2” CLEARANCE ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.

LABELS:

- ☐ SWEDGED BOLTS FOR EDGE BEAM REINFORCEMENT AT OUTSIDE BEAMS

DIMENSIONS:

- ☐ Edge of beam to first stirrup
- ☐ Stirrup spacing

DETAILS:

REINFORCEMENT:

- ☐ Main transverse steel in edge beam
- ☐ Stirrup steel

40.13.4 PARTIAL SECTION THRU END WALL

Make a copy of 40.13.3 and change all “edge beams” to “endwall”

40.14 STEEL SUPERSTRUCTURE: MISCELLANEOUS SUPERSTRUCTURE DETAILS CHECKLIST

See Section 24

The appropriate Superstructure details should be placed on drawings as follows:

- ☐ Deck Plan Drawings
- ☐ Expansion joint
- ☐ Construction joint
- ☐ Expansion joint in barrier, parapet, sidewalk, parapet and/or median
- ☐ Barrier transition
- ☐ Barrier reinforcement
- ☐ Sidewalk and parapet
- ☐ Raised median
- ☐ Curb face
- ☐ Deck drain
- ☐ Bar bending at skewed joints
- ☐ Bars in acute-angled corners of deck at intermediate bents
- ☐ Fence Elevation
- ☐ Fence Post Detail
- ☐ Deck Sections Drawing
- ☐ Utility hanger
- ☐ Sections through:
- ☐ Edgebeam
- ☐ Diaphragm
- ☐ Crown detail
- ☐ Light standard: Plan, elevation, and details

Notes

- ☐ MAINTAIN 2" CLEARANCE ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.

40.15 CONCRETE PARAPET DETAILS CHECKLIST

Same as for concrete superstructure. See checklist in Section 40.5

40.16 STEEL SUPERSTRUCTURE: BEAM LAYOUT (FRAMING PLAN) CHECKLIST

See Section 28

LINE WORK:

- ☐ Longitudinal lines
- ☐ Centerline Beam
- ☐ Reference Line
- ☐ Transverse lines

NOTES:

- ☐ Description of the beam layout

LABELS:

- ☐ BFPR
- ☐ Centerline Bent
- ☐ Centerline Diaphragm or cross frame
- ☐ Angles of intersection between:
 - ☐ BFPR and Centerline Beam
 - ☐ Centerline Bent and Centerline Beam
 - ☐ Centerline Beam and Diaphragm or Cross Frame
- ☐ Span ID
- ☐ Reference line ID
- ☐ CL Bearing
- ☐ Transverse stiffeners

DIMENSIONS:

- ☐ Along BFPR and Centerline of bents
- ☐ Between beams
- ☐ Between beams and Reference Line
- ☐ Along centerline of beams
- ☐ Between BFPR and Diaphragm or Cross Frame
- ☐ Between Diaphragm or Cross Frame and centerline of bent
- ☐ Between centerline of bent and Diaphragm or Cross Frame
- ☐ Between Diaphragm or Cross Frame and BFPR
- ☐ Transverse Stiffeners

DETAILS:

REINFORCEMENT:

40.17 STEEL SUPERSTRUCTURE: STEEL BEAM DETAILS CHECKLIST

See Section 27

LINEWORK:

- ☐ Top flange
- ☐ Web
- ☐ Bottom flange
- ☐ Stiffeners

NOTES:

- ☐ Camber compensates for total dead load deflection and effects of vertical curve, eg: CAMBER ORDINATE SHOWN INCLUDES DEAD LOAD DEFLECTION DUE TO THE BEAM, SLAB, COPING, PARAPET, SIDEWALK AND CROSS FRAMES AND INCLUDES THE VERTICAL CURVE ORDINATE.
- ☐ Charpy V-notch (CVN) note for main tension members: [CVN] INDICATES COMPONENT IS A MAIN LOAD CARRYING MEMBER SUBJECT TO TENSILE STRESS AND SHALL MEET THE CHARPY V-NOTCH TEST REQUIREMENTS AS SPECIFIED IN SECTION 851 OF THE GEORGIA DOT SPECIFICATIONS.
- ☐ Note for Structural Steel Type(s) eg: STRUCTURAL STEEL FOR ALL TOP AND BOTTOM FLANGES AND WEBS SHALL CONFORM TO ASTM A709 GRADE 50. ALL OTHER STRUCTURAL STEEL SHALL CONFORM TO ASTM A709 GRADE 36.

LABELS:

- ☐ Centerline beam
- ☐ Bent ID
- ☐ Skew angles (beam relative to bents)
- ☐ Field splice locations
- ☐ Plate sizes
- ☐ CVN label ID
- ☐ Weld labels
- ☐ CL Bearing
- ☐ Shop splice locations

DIMENSIONS:

- ☐ W shape – length and designation
- ☐ Plates – length and width or thickness for top flange, web and bottom flange
- ☐ Shear connectors
- ☐ End of beam to first row of shear connectors
- ☐ Shear connector spacing
- ☐ Last row of shear connectors to end of beam
- ☐ Splices
- ☐ End of beam to centerline of splice
- ☐ Centerline of splice to centerline of bent
- ☐ End of beam to centerline of bearing
- ☐ Centerline of bearing to centerline of bearing

- ☐ Total beam length
- ☐ End of beam to centerline of web stiffeners

DETAILS:

- ☐ Beam grade and camber ordinate diagram
- ☐ Table of dead load deflections by pour
- ☐ Beam Dead Load Deflection Diagram
- ☐ Diaphragm or Cross Frame details
- ☐ Stiffener details
- ☐ Shear Connector details
- ☐ Shop weld preparation and procedures

REINFORCEMENT:

Not Applicable

40.18 STEEL SUPERSTRUCTURE: STEEL PLATE BEARING DETAILS CHECKLIST

See Section 30

40.18.1 BEARING ASSEMBLY PLAN VIEW

LINE WORK:

- ☐ BFPR and / or edge of cap
- ☐ Centerline beam
- ☐ Centerline bearing
- ☐ Outline of beam bottom flange
- ☐ Outline of endwall at end bents
- ☐ Hole or slot outlines
- ☐ Outline of plates
- ☐ Outline of backwall at end bents

NOTES:

Not applicable

LABELS:

- ☐ BFPR
- ☐ Centerline bearing
- ☐ Centerline beam
- ☐ Endwall thickness
- ☐ Fixed or expansion (exp) type
- ☐ Angle between centerline beam and centerline bearing or BFPR
- ☐ Backwall thickness

DIMENSIONS:

- ☐ Between Centerline bent or BFPR and Centerline bearing

DETAILS:

- ☐ Anchor bolt

REINFORCEMENT:

Not applicable

40.18.2 BEARING ASSEMBLY ELEVATION VIEW

LINE WORK:

- ☐ Partial view of beam showing end of beam and bottom flange
- ☐ Partial view of endwall or backwall at end bents
- ☐ Cap

- ☐ Centerline bearing
- ☐ Outlines of neoprene pad (if included), bearing plate, self-lubricating plate (if included), and sole plate

NOTES:

- ☐ Notes on 1/8" Neoprene pad

LABELS:

- ☐ Centerline bearing
- ☐ Centerline bent
- ☐ Fixed or expansion (exp) type
- ☐ Weld between sole plate and beam bottom flange
- ☐ Hole or slot size in beam bottom flange
- ☐ Plate or neoprene pad type (number)

DIMENSIONS:

- ☐ Bearing table with design loads

DETAILS:

Not applicable

REINFORCEMENT:

Not applicable

40.18.3 NEOPRENE PAD AND PLATE DETAILS

LINE WORK:

- ☐ Outline of plates or neoprene pad in plan and elevation
- ☐ Outline of holes or slots
- ☐ Centerlines of neoprene pads or plates
- ☐ Centerline of holes or slots

NOTES:

Not applicable

LABELS:

- ☐ Plate or neoprene pad number
- ☐ Centerline bearing
- ☐ Centerline beam
- ☐ Hole or slot sizes

DIMENSIONS:

- ☐ Plate or neoprene pad plan out-to-out dimensions
- ☐ Plate or neoprene pad thickness
- ☐ Location of holes or slots from edge and centerlines
- ☐ Radius of curved surfaces for sole plates or self-lubricating bronze plates.

DETAILS:

Not applicable

REINFORCEMENT:

Not applicable

40.18.4 NOTES

- ☐ Material requirements for bearing, shim, and sole plates
- ☐ Material requirements for self-lubricating plates
- ☐ Anchor bolt size and embedment into concrete cap
- ☐ Anchor bolt washer size and nut type
- ☐ Material requirements for anchor bolts, including minimum projection above top of beam flange.
- ☐ Material requirements for neoprene pads.

40.19 END BENT CHECKLIST

See Section 32

NOTES:

- ☐ MAINTAIN 2" CLEARANCE ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.
- ☐ POUR WINGWALLS MONOLITHICALLY WITH CAP
- ☐ SEE GEORGIA STANDARD 9037 FOR DRAINAGE DETAILS AT END BENT.

DETAILS

- ☐ Section through cap at pile
- ☐ Section through cap between piles
- ☐ Substructure quantities
- ☐ Anchor Bolt layout (if needed)

Plan Driving Objective:

- ☐ ALL PILES SHALL BE (PSC, 18 IN SQ) (STEEL H, HP 14 X 73) (METAL SHELL, 18 IN OD)
- ☐ DRIVE ALL PILES TO A DRIVING RESISTANCE OF XX TONS AFTER A MINIMUM TIP ELEVATION OF XXX IS ACHIEVED.

Small P&E for other end bent (if it is not on a separate sheet) showing:

- ☐ Beam ID
- ☐ End Bridge Station
- ☐ Ahead arrow
- Elevations
 - ☐ Top of wings
 - ☐ Cap steps
 - ☐ Bottom of cap

40.19.1 PLAN VIEW

LINE WORK:

- ☐ Piles (solid in cutaway, otherwise dashed)

DIMENSIONS:

- ☐ Wingwall length and width
- ☐ Pile box length and width (usually 2'-6")
- ☐ End of wing to center of end pile
- ☐ Edge of pile box to center of pile
- ☐ Face of wing to edge of pile box
- ☐ Width of cap
- ☐ Distance from BFPR to centerline bearing

- ☐ Distance from centerline bearing to front face of cap
- ☐ Dimensions of fillet (2' x 2')
- ☐ Paving rest, if backwall present
- ☐ Backwall

Dimensions along front face of cap:

- ☐ CL beam at CL bearing to CL beam at front face of cap (if bent is skewed)
- ☐ Inside face of wing to CL exterior beam
- ☐ Beam spacing
- ☐ Beam spacing in middle broken by reference line
- ☐ Inside face of wing to cap step
- ☐ Cap steps
- ☐ Length of cap from inside face of wing to inside face of wing

LABELS:

- ☐ Begin (or end) bridge station at BFPR and reference line
- ☐ Reference line
- ☐ BFPR
- ☐ CL Bearing
- ☐ Beam ID's
- ☐ Ahead arrow
- ☐ FORM 3" DIA. X 12" DEEP HOLE FOR DOWEL BAR, TYP.
- ☐ Paving rest, if backwall present
- ☐ Backwall

Angles of intersection between:

- ☐ BFPR and Reference line
- ☐ CL Bearing and Centerline of beams
- ☐ Front face of wingwall and cap

REINFORCEMENT:

- ☐ Pile box stirrups (412) and corner bars (413)
- ☐ Wingwall vertical (510) and horizontal (511) with total number, number each face equally spaced
- ☐ Fillet bars, 3, TMB (610)
- ☐ Main cap (1010)
- ☐ Cap stirrups (410 over caps; 411 between caps)

40.19.2 ELEVATION VIEW (BELOW PLAN VIEW WITH PILES ALIGNED VERTICALLY)

LINE WORK:

- ☐ Wingwalls (oblique for skews)
- ☐ Pile box
- ☐ Piles (solid in cutaway, otherwise dashed in cap)

NOTES:

- ☐ WINGWALL PILES NOT SHOWN

LABELS:

Elevations:

- ☐ Top of wingwalls
- ☐ Cap steps
- ☐ Bottom of cap (level, or at corner and construction joints)

DIMENSIONS:

- ☐ Inside face of wingwall to centerline pile
- ☐ Centerline pile to centerline pile
- ☐ Centerline pile to Inside face of wingwall
- ☐ Inside face of wingwall to Inside face of wingwall
- ☐ Height of pile box
- ☐ Utility block-outs (if backwall present)

REINFORCEMENT:

- ☐ Main cap reinforcement (4-1010)
- ☐ Stirrups in exterior (411) located from inside face of wing
- ☐ Stirrups between piles (411) located from centerline piles
- ☐ Stirrups over piles (410)
- ☐ Reinforcement around utility block-outs (backwalls)

40.20 INTERMEDIATE BENT CHECKLIST

See Section 33

NOTES:

- ☐ SPREAD FOOTINGS ARE DESIGNED FOR A BEARING PRESSURE OF * TONS PER SQUARE FOOT.
- ☐ MAINTAIN 2" CLEARANCE ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED
- ☐ BENT CAP IS SYMMETRICAL ABOUT CL CAP

DETAILS:

- ☐ Quantities Table
- ☐ Sections thru cap showing max reinforcement in top (may also show double stirrup)
- ☐ Section thru cap showing max reinforcement in bottom
- ☐ Section thru column (clearance is 3 5/8" if column and cap are same width, otherwise 2") (column bar in corner)
- ☐ Footing – if the footing isn't symmetrical or for pile footings to show pile locations
- ☐ Bar bundling (if two layers of reinforcement in cap)
- ☐ Anchor bolt layout (if not shown on plan view)

- ☐ PLAN DRIVING OBJECTIVE
 - ☐ ALL PILES SHALL BE (PSC, 18 IN SQ) (STEEL H, HP 14 X 73) (METAL SHELL, 18 IN OD)
 - ☐ ALL PILES SHALL BE DRIVEN TO A DRIVING RESISTANCE OF * TONS AFTER A MINIMUM TIP ELEVATION OF * IS ACHIEVED.

40.20.1 PLAN VIEW – TOP LEFT CORNER OF THE DRAWING

LABELS:

- ☐ CL Bearing
- ☐ CL Bent
- ☐ Ahead arrow (footing details only)
- ☐ FORM 3" DIAMETER X 12" DEEP HOLE FOR DOWEL BAR, TYP.
- ☐ Beam ID's
- ☐ Station at reference line and CL bent
- ☐ Angle of Centerline Bent and Reference line
- ☐ Angle of Centerline Bent and Centerline of beams

DIMENSIONS:

- ☐ Width of cap
- ☐ CL Bent to face of cap
- ☐ CL Bent to CL bearing

- ☐ End of cap to CL Bearing at CL Bent for exterior beams
- ☐ Beam spacing along CL Bent
- ☐ CL Beam at CL Bent to Reference line at CL Bent
- ☐ Cap steps
- ☐ Length of cap

REINFORCEMENT:

none

40.20.2 ELEVATION VIEW – CENTERED BELOW THE PLAN VIEW

LINE WORK:

- ☐ Top of cap
- ☐ Top of cap (ahead or back, if riser present)
- ☐ Bottom of cap
- ☐ Columns
- ☐ Footings
- ☐ Piles (solid in cutaway, dashed in footing otherwise)

DIMENSIONS:

- ☐ End of cap to CL column
- ☐ Column spacing
- ☐ Width of column
- ☐ CL column to face of column
- ☐ Face of column to edge of footing
- ☐ Depth of footing
- ☐ Width of footing
- ☐ Depth of pile in footing (1'-0")
- ☐ Stirrup spacing

LABELS:

- ☐ Column numbers
- ☐ CL Cap
- ☐ REQUIRED CONSTRUCTION JOINT, TYP. At top of column
- ☐ *CONSTRUCTION JOINT, TYP. 4" above top of footing
- ☐ Caisson tip elevation
- ☐ Top of Caisson elevation (if column sits on caisson)

Elevations:

- ☐ Cap steps
- ☐ Bottom of cap (at ends and faces of columns)
- ☐ Bottom of footing

NOTES:

- ☐ *AT CONTRACTOR'S OPTION CONSTRUCTION JOINT MAY BE RELOCATED TO TOP OF FOOTING
- ☐ BARS 421 NOT SHOWN (bars in face of cap)

REINFORCEMENT:

Cap:

- ☐ Moment with cutoffs located (1122, 1123) in top
- ☐ Moment with cutoffs located in bottom
- ☐ Shear, all spacing located (520), show doubled stirrups as needed
- ☐ Nominal reinforcement in cap risers or steps

Column:

- ☐ Moment with lap lengths (1121)
- ☐ Shear (420) with number and spacing

Footing:

- ☐ J bars (1120) (9'-0" lap for No. 11's)
- ☐ Moment (hooks in pile footings, no hooks in spread footings) with clearance above piles, clearance to edge

40.21 AS-BUILT FOUNDATION INFORMATION CHECKLIST

See Section 35

LINE WORK:

NOTES:

- ☐ Centerline footing = centerline column
- ☐ Instructions to field engineer
- ☐ PROJECT ENGINEER and DATE
- ☐ AREA CODE AND TELEPHONE NUMBER

LABELS:

DIMENSIONS:

DETAILS:

REINFORCEMENT:

Pile end bent table

- ☐ Bent number
- ☐ Left Wingwall
 - ☐ End
 - ☐ Middle
- ☐ Beam 1
- ☐ Battered pile
- ☐ Beam 2

Pile intermediate bent table

- ☐ Bent number
- ☐ Pile location by Beam number

Tower Pile Bent

- ☐ Pile Tip Elevations Table that has the following data
- ☐ Bent number
- ☐ Pile location
- ☐ Back and Ahead
- ☐ Beam number

Concrete bent with caisson table:

- ☐ Bent number
- ☐ Top and bottom of caisson
- ☐ Caisson number

Table for spread footings

- ☐ Bent number
- ☐ Column number
- ☐ Footing elevation
- ☐ Seal elevation (if present)

Concrete Bent with pile footings table:

- ☐ Bent number
- ☐ Column number
- ☐ Footing elevation
- ☐ Seal elevation
- ☐ Pile Number

Footing Elevation Detail

- ☐ Footing
- ☐ Column
- ☐ Seal (if present)

Footing plan view

- ☐ Outline of footing
- ☐ Ahead arrow
- ☐ Pile numbers
- ☐ Represent each pile pattern on bridge

40.22 WALL PLANS FOR CONTRACTOR DESIGNED WALLS CHECKLIST

See Section 37

40.22.1 PLAN VIEW

LINE WORK:

- ☐ Reference line for wall construction
- ☐ Front face of wall
- ☐ Back face of wall panel
- ☐ Temporary shoring or walls as needed for construction
- ☐ Utility centerlines

FOR WALLS AT ENDS OF BRIDGES:

- ☐ Centerline of Bridge
- ☐ Outline of End bents of bridge

NOTES:

LABELS:

- ☐ Reference Line
- ☐ Front Face of Wall
- ☐ Begin Wall No. X
- ☐ End Wall No. X
- ☐ Breaks in wall alignment or changes in Reference line for wall construction
- ☐ North Arrow
- ☐ FOR WALLS AT ENDS OF BRIDGES
- ☐ Station Equalities for bridge centerline and wall reference lines

DIMENSIONS:

DETAILS:

REINFORCEMENT:

LINE WORK:

- ☐ Top of Coping
- ☐ Proposed Grade Lines (Top of Wall, Bottom of Wall)
- ☐ Existing Grade Line
- ☐ Top of Leveling Pad
- ☐ Breaks in Wall (Vertical Line)
- ☐ CL Utility crossings
- ☐ Drainage structures immediately behind wall
- ☐ Slip Joints

NOTES:

- ☐ "STATIONS ARE MEASURED ALONG ____"
- ☐ For Top Elevations "** ELEVATIONS SHOWN ARE AT THE TOP OF COPING AT THE FRONT FACE OF WALL" (OR SIMILAR NOTE)
- ☐ For Bottom Elevations "*** ELEVATIONS SHOWN ARE THE MAXIMUM ELEVATION AT THE TOP OF LEVELING PAD" (OR SIMILAR NOTE)

LABELS:

- ☐ "Looking at ____ Face of Wall" (under Elevation Title)
- ☐ Proposed Grade
- ☐ Top of Coping, Sidewalk, etc.
- ☐ Top of Leveling Pad
- ☐ Begin and End Wall stations and elevations (check that stations match Plan View)
- ☐ 50 ft Stations and Elevations, breaks in wall profile, staging locations
- ☐ Elevation Ladder Bars
- ☐ Delineation of Stages (Stage I, Stage II, etc.)
- ☐ Vertical curve data
- ☐ Horizontal curve data
- ☐ Expansion and contraction joints
- ☐ Approximate original ground line
- ☐ Horizontal and Vertical scales

DIMENSIONS:

- ☐ Overall wall length
- ☐ Dimensions to bends in wall
- ☐ Dimensions to steps in footing / leveling pad
- ☐ Dimensions to vertical breaks, high points, and low points in coping or top of wall

DETAILS:

☐ Typical Section

REINFORCEMENT:

40.22.3 DETAILS AND OTHER PERTINENT INFORMATION

LINE WORK:

NOTES:

LABELS:

DIMENSIONS:

DETAILS:

REINFORCEMENT:

NOT INCLUDED IN THE MANUAL

40.23 PURPOSE

40.24 GENERAL GUIDANCE

40.25 REQUIRED PRACTICES

40.26 CHECKLIST

LINE WORK:

NOTES:

LABELS:

DIMENSIONS:

DETAILS:

REINFORCEMENT: